THE FEASIBILITY OF A BODY IMAGE AND IMPLEMENTATION INTENTIONS INTERVENTION TO PREVENT SKIN CANCER AMONG ADOLESCENT AND YOUNG ADULT LIFEGUARDS

by

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STATEMENT OF DISSERTATION APPROVAL

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ABSTRACT

This dissertation evaluates the feasibility of two approaches of promoting skin cancer prevention programs in the adolescent and young adult athlete and lifeguard populations. The paper begins by providing the background behind skin cancer risk, prevention and early detection motivators, intentions and behaviors for athletes and lifeguards and describes educational programs used to improve skin protection in these populations. The paper then describes an educational program to be delivered in outdoor pool settings that has components of a body image intervention and an implementation intentions intervention.

Chapters 2, 3 and 4 are articles intended for publication in health education literature. Chapter 2 is an applied paper that examines the risk, barriers and motivators that impact sun protective behaviors among athletes and describes the role that professionals such as coaches, trainers, athletic administrators and sport psychologists have in promoting positive behaviors. The article provides four strategies to guide these professionals in developing a more effective comprehensive skin protection program for athletes.

Chapters 3 and 4 report the results of research on sun protection in the lifeguard community. Chapter 3 is a qualitative description analyzing worksheets completed by lifeguards as part of the implementation intentions intervention component of the

educational program. The results revolve around the nature of the barriers identified by the participants and their unique solutions to addressing those barriers. Chapter 4 reports quantitative data surrounding the role of body image as a motivator for sun protective behaviors. The analysis compares how the extended parallel process model constructs of perceived threat of skin cancer and appearance predict sun protective intentions and behaviors in a sample of lifeguards employed in swimming facilities. Results of this study demonstrate that among these lifeguards, appearance motives were stronger predictors of positive health behaviors than health motives.

Finally, Chapter 5 provides implications of this research and future directions for improving sun protection behaviors among adolescent and young adult athletes and lifeguards. Specific recommendations for health educators are provided.

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CHAPTER 1

THE FEASIBILITY OF A BODY IMAGE AND IMPLEMENTATION INTENTIONS INTERVENTION AMONG ADOLESCENT AND YOUNG ADULT LIFEGUARDS AND ATHLETES

The American Cancer Society (2014) estimates that there are approximately 3.5 million skin cancer cases in the United States every year. If these cases are left untreated, severe health problems can result. Although only accounting for 5% of all new skin cancer cases, melanoma accounts for a majority of all skin cancer related deaths. Basal and squamous cell carcinomas are not as deadly as melanoma, and account for about 3,170 deaths annually (Skin Cancer Foundation, 2012). The American Cancer Society (2014) estimates that 76,100 new cases of melanoma will be diagnosed this year and 9,710 people will die of the disease in the United States. Melanoma is found in individuals of all ages and is the leading cause of cancer-related death in women ages 25 to 35 (Devita, Lawrence & Rosenberg, 2011). A disturbing trend is the increasing incidence of melanoma among young adults ages 18 to 39 (Reed et al., 2012).

Common risk factors for all types of skin cancer include behavioral, personal and hereditary factors. Behavioral factors include exposure to UV radiation through

sunlight or artificial tanning beds, and personal factors including fair skin that burns easily, green, blue or gray eyes, blond or red hair and a large number of freckles on the skin. Having a medical history of severe sunburn, suppressed immunity or the use of some antibiotics, hormones and antidepressants can also increase the risk of developing skin cancer. Additionally, melanoma can be linked to a personal or family history of the disease or other inherited skin conditions (National Cancer Institute, 2012).

The American Academy of Dermatology (2012) recommends five specific skin health behaviors for primary prevention of skin cancer. These steps include seeking shade during peak hours, wearing protective clothing, applying broad spectrum sunscreen frequently and generously, using extra caution around water, sand and snow and avoiding intentional tanning (e.g., tanning beds).

Secondary prevention steps for skin cancer are more controversial. The U.S. Preventive Services Task Force (2009) does not currently recommend screenings (e.g., self-exam or clinician screening) for melanoma or nonmelanoma skin cancer in the general public. Unfortunately, Wolff, Tai and Miller (2009) admitted that this stance on screening represented a lack of evidence related to the efficacy of routine screening. However, the American Cancer Society (2013) recommends physician skin exams as part of a regular cancer-related evaluation and argues that individuals should conduct regular skin self-exams.

Skin Cancer Risk and Athletes

Recently, a multisport survey on National Collegiate Athletic Association (NCAA) athletes at two major universities identified characteristics related to athletes

that may put them at higher risk. Wysong et al. (2012) surveyed athletes (*N*= 290) and found that athletes spent an average of 4 hours per day in the sun; however, sunscreen was not used on a regular basis. In fact, only 50% of student-athletes reported using sunscreen at all and 25% of athletes used sunscreen only three times each week. The authors concluded that being female, having recent sunburns, having a fear of skin cancer, sunburn and wrinkles as well as knowing someone with skin cancer are factors that increase the tendency to wear sunscreen.

Similar findings to Wysong et al. (2012) were observed by Berndt et al. (2010) in young adults ages 18 to 30 competing in soccer (*N*=65), surf-lifesaving (*N*=63), hockey (*N*=61), and tennis (*N*=48). Athletes were surveyed about their use of sunscreen at their last competition on a sunny day. Interestingly, 29.5% of these young adults reported that they did not use sunscreen while 47.3% of respondents reported inadequate use (i.e., failure to apply sunscreen 30 minutes prior to sun exposure, reapplying every 2 hours) that day. Furthermore, the investigators found risk perceptions to be predictive of sunscreen use leading to the conclusion that behavioral interventions should be geared around reducing barriers to use and increasing a sense of personal importance of sunscreen.

Ambrose-Rudolf et al. (2006) discovered that a sample of competitive runners (*N*=210) had more atypical moles compared to a control group of a similar age and sex and that the findings were also related to training intensity. These findings led to a recommendation for runners to choose training and competition schedules at times of the day that tend to yield lower UV levels and to wear appropriate protective clothing and sunscreen regularly. In a separate study (Moehrle, 2001) among Ironman triathletes

(*N*=3), dosimeters (devices used to measure amounts of UV radiation) recorded UV radiation exposure levels to exceed by 30 times the levels set by the International Commission for Non-Ionizing Radiation Protection and the American Conference of Governmental Industrial Hygienists.

Dosimetry studies (Moehrle, Heinrich, Schmid & Garbe, 2000; Serrano, Canada & Moreno, 2010) have further confirmed the high amounts of UV radiation exposure athletes experience. In a small study among cyclists (*N*=5) high UV exposure was recorded using dosimetry over two, 4-day periods in Spain (Serrano, et al. 2010). The dosimeters recorded levels of UV radiation exceeding occupational and recreational guidelines during both summer and winter periods studied. Moehrle et al. (2000) found excessive UV exposure using dosimeters on a sample of cyclists (*N*=8) competing in a race in Switzerland. As with the study among Ironman competitors, dosimeters recorded UV radiation levels exceeding international limits by 30 times over the eight stages of the race.

Although these dosimetry studies show high exposure among elite athletes over the duration of the day, Downs, Parisi and Schouten (2011) evaluated UV exposure for golfers with scheduled, weekly tee times by calculating the amounts of UV radiation by sun angle across latitudes. Their findings suggest that golfers who held tee times in the mid- to late morning hours had the greatest risk for skin cancer. These findings about golfers support the generalization of findings to other sports (e.g., baseball, soccer, cross country) conducted on a grassy surface.

In addition to environmental risk concerns, behavioral risk factors have been evaluated among athletes. Cohen, Tsai and Puffer and colleagues (2006) surveyed high

school and collegiate athletes in Los Angeles (*N*=1,006) about their sun protective behaviors and demonstrated that athletes in both the university and high school settings were at higher risk for increased exposure to UV radiation. Moreover, these athletes were less likely to wear protective clothing (e.g., long shirts and long pants) but did wear hats and sunscreen more often than their control group counterparts. Among university athletes, more indoor and outdoor tanning behaviors were observed compared to controls.

Winter sport athletes may also have an increased risk for skin cancer. Buller et al. (2011) conducted a cross sectional survey study among adult skiers and snowboarders (*N*=4837) and found that only 4.4% of participants reported full compliance with sunscreen recommendations. Although 73.2% of those who reported applying sunscreen appropriately applied it 30 minutes prior to sun exposure, only 20.4% effectively reapplied sunscreen as recommended.

Skin Cancer Risk and Lifeguards

Although there is a paucity of literature surrounding lifeguards and skin cancer risk, a rare study by Gies, Glanz, O'Riordan, Elliott and Nehl (2009) used dosimeter wristbands to measure the amount of UV exposure lifeguards (*N*=168) experienced while on the job. Dosimetry results showed that at least 74% of lifeguards experienced UV radiation exposure above recommended thresholds for occupational exposure as accepted by the International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1999). These findings also revealed an inadequacy of skin protection behaviors that likely contributed to over 50% of these lifeguards self-reporting sunburns

at least twice each year. As many swimming pool lifeguards are competitive swimmers, it is reasonable to extend findings pertaining to athletes to lifeguards. Although the literature surrounding sun protective behaviors and environmental exposures demonstrates a concern for skin cancer among lifeguards and athletes, motivational considerations relating to appearance factors needs to be considered in designing interventions to address risky behaviors within the population.

Body Image and Tanning

In reviewing the literature on adolescent tanning practices, Reynolds (2007) found that there was an overwhelming sense among adolescents to disregard long-term health risks to attain the appearance effects associated with indoor and outdoor practices. The author found that most of the efforts toward preventing tanning bed use were geared around increasing knowledge about the practice.

A recent study by Merten, Higgins, Rowan and Pragle (2014) of adolescent beachgoers showed that appearance was a reported motivator for sunseeking behaviors. The authors found 80% of respondents believed tanned skin looked healthy, potentially serving as a motivation to expose skin to sun without protection. In addition, only 63% of the respondents could identify peak hours of UV exposure and only 11% knew that sunscreen should be applied 30 minutes prior to sun exposure. At the time of the survey, many participants had applied sunscreen, but only 14% had reapplied after 2 hours of use, putting them at increased risk for sunburns.

Another study among adolescent athletes (N=554) in Argentina (Lafargue, Merediz, Bujan & Pierini, 2012) found a significant gender difference in the association

between health, beauty and tanned appearance. Males in the study were more likely to associate tanned skin with health and females were more likely to associate tanned skin with beauty. These findings are not surprising given the results of content analyses of advertizing and magazines over the past decade (Cho, Hall, Kosmoski, Fox, & Mastin, 2010; Team & Markovic, 2006). Team and Markovic (2006) found that online advertisements from tanning salons in Australia mostly targeted women and only featured limited information on health risks while displaying messages about tanning as safe and relaxing. Cho et al. (2010) found that about 40% of magazine articles touted tanning as a means of looking healthy and that messages about health and appearance benefits far outweighed information about consequences of tanning practices, particularly in magazines directed toward younger girls.

Females

Of course, one can question the influence magazine exposures have on actual health behavior. Dixon, Dobbinson, Wakefield, Jamsen and McLeod (2011) compared the content of spring and summer issues of popular magazines with survey data of a sample of women (*N*=4,422). This study found a significant relationship between exposure to messages and beliefs about the health and appearance effects of tanning. Among younger women, the results showed a significant relationship between exposure and the perception of peer norms that support tanned skin for health and beauty purposes.

In a study among teenage cheerleaders, SooHoo, Reel and Pearce (2011) considered body comparison with peers by citing an example by one respondent

comparing herself with others in her peer group in terms of the evenness and depth of their tans. Although tanned skin does not emerge as a major theme in their study, the comparison to others in the peer group was a key factor in the construction of one's perception of appearance norms within the peer group.

Males

Males are not immune to the effects of tanning on perceived appearance. A study by Banerjee, Campo and Greene (2008) screened images of models in front of a group of college aged men (*N*=135) and women (*N*=226) and had subjects report their sense of the model's health attractiveness, thinness and height. Males were more likely to perceive the darkly tanned models as more physically attractive and healthier than the lightly tanned and moderately tanned models in the images.

Yoo (2009) found that appearance factors for choosing tanning behaviors are also not limited to females. In a study with adolescent boys (*N*=155), appearance motives predicted tanning bed use, piercing and tattooing regardless of their understanding of potential permanent effects and health risks of these behaviors. These motivations were largely tied to peer influences. Reilly and Rudd (2008) found that appearance motives also predicted tanning behaviors among gay men (*N*=103). Their findings suggest that men desire the tanned appearance, but also use tanning as a means of socializing. The authors explain that a sense of internalized homophobia influences both peer group construction and the identification of appearance norms as well as lower self-esteem issues which may motivate gay men to seek a tan as a way to connect to the community and improve their sense of self.

Community-Based Prevention Programs

Many community-based programs designed for skin cancer control employ a combination of primary (i.e., sunscreen use, avoiding UV radiation) and secondary prevention outcomes (i.e., self or physician skin exams) as educational objectives and means to measure success. Kasparian, McLoone and Meiser (2009) recommended that targeted interventions be developed to promote primary and secondary behaviors to prevent skin cancer and to find it early. The authors suggest that identifying strategies of overcoming barriers such as forgetting to apply sunscreen should be the emphasis of educational programs.

Appearance-Based Approaches

Tanning behaviors are often targeted in community-based programs to reduce risk of skin cancer. Recently, appearance-based interventions have been used among sun seekers and tanning bed users as a means of motivating participants to reduce UV exposure (Cafri, Thompson, Jacobsen & Hillhouse, 2009). Abar et al. (2010) implemented a workbook intervention designed to educate about risks of skin cancer and influence appearance through alternatives to indoor tanning among female college students (*N*=1,690). They found that participants who engaged in moderate and heavy tanning prior to the program decreased their frequency of tanning bed use when exposed to a short workbook-based intervention compared to controls. Their findings suggest that short interventions can produce practically significant effects in prevention behaviors in a way that is time and cost effective. Similarly, Hillhouse, Turrisi, Stapleton and Robinson (2008) reported reduction in tanning intentions among female

indoor tanners (*N*=430) across months where generally intentions and behaviors increase while developing the workbook used in the previous study suggest efficacy of the appearance-based approach.

Mahler, Kulik, Gibbons, Gerrard and Harrell (2003) used UV photography techniques in two separate experiments designed to increase sun protective behaviors. UV photography uses a special filter on a camera that exposes underlying pigmentation changes on an individual's skin allowing him or her to see the damage the UV exposure has caused. In these approaches, they found an increase in sun protection and a reduction in sun seeking among those exposed to UV photography. The first experiment among both male and female undergraduates in California (*N*=68) randomized participants into a group that had UV facial photographs or into a control group. The results showed a stronger intention to use sunscreen in the future and lower perceived rewards in the photo group compared to the control group. The second experiment combined education with the photo intervention in a factorial design among southern California residents (*N*=76). Among those participants, posttest data revealed a stronger intention toward future sunscreen use compared with those who did not receive the photo treatment. The authors also emphasize the ease and cost-effectiveness of the intervention, suggesting the high return of investment in promoting healthy skin.

Hillhouse, Turrisi, Stapleton and Robinson (2010) studied the effects of an appearance-based approach on college females with Seasonal Affective Disorder (SAD) who used tanning beds to improve their mood during the winter, low daylight months. The authors suggested that an appearance-based approach can reduce tanning behaviors among participants with pathological motives. However, the study did not include

participants that were clinically diagnosed with SAD, suggesting that deeper disorders that lead to artificial tanning such as tanning addiction (Mosher & Danoff-Berg, 2010) or body dysmorphic disorder (Phillips et al., 2006) may not be sensitive to appearance-based approaches.

Evidence-based targeted interventions conducted in lifeguard and athlete populations are sparse. In fact, no interventions on skin cancer prevention could be found in the literature targeting athletes and only two programs were identified that target lifeguards. One program targeting both lifeguards and child and adult patrons showed increases in protective behaviors among both populations (Winett et al., 1997). Another program called Pool Cool Plus (Hall, Elliott, Nehl, & Glanz, 2008) resulted in a reduction in sunburns among lifeguards in the treatment group compared to control. The findings further suggest that community programs can improve protective behaviors with small exposure to education and limited costs.

Each of the programs discussed utilized a randomized controlled trial design measured with surveys. One program (Winett et al. ,1997) also used observations to measure behaviors at the pools. The evaluation measures varied between questionnaires developed for the program to instruments scientifically validated, such as measured designed by Cafri et al. (2008) and Cafri et al. (2006), to measure tanning motivations. Unfortunately, none of the programs reviewed measured specific outcomes toward secondary prevention behaviors.

Implementation Intention Interventions

Gollwitzer (1999) described implementation intentions as intermediate steps in achieving a goal intention where a specific outcome is achieved. A goal intention will look like "I intend to reach *x*!" (p. 494), whereas an implementation intention addresses circumstances or barriers in the situation by stating "when situation *x* arises, I will perform response *y*." Gollwitzer explains that this process aids in making the behaviors more automatic as they do not require conscious intention. In other words, the choice is already made.

Implementation intention interventions are strategies that help participants identify a specific goal intention and develop overt implementation intentions to aid in its fulfillment. Implementation intention interventions have been effectively used in a variety of health topics including cancer self-exams (Prestwich et al., 2005; Steadman & Quine, 2004), cancer screenings (Kinney, Boonyasiriwat, Walters, Pappas, et al, 2014; Rutter, Steadman & Quine, 2006; Sheeran & Orbell, 2000), fruit or vegetable consumption (Chapman & Armitage, 2012; Chapman, Armitage & Norman, 2009; Jackson et al., 2005), medication adherence (Brown, Sheeran & Reuber, 2009; de Noojier, Jansen & van Assema, 2012; Jackson et al., 2006), physical activity (Andersson & Moss, 2011; Arbour & Martin Ginis, 2009; De Vet, Oenema, Sheeran & Brug, 2009) and alcohol use (Hagger, Lonsdale & Chatzisarantis, 2012).

In a sample of parents, implementation intention interventions were used to create action plans for protecting their children from the sun over the upcoming summer (van Osch, Reubsaet, Lechner & de Vries, 2008). No significant effect was found, however, a significant interaction among motivation groups and implementation

intentions was observed in the study. Highly motivated parents were found to increase sunscreen use when exposed to the implementation intention intervention.

Extended Parallel Process Model

The Extended Parallel Process Model (EPPM) was derived by Witte (1992) by combining and extending theoretical constructs and relationships from three previous models of fear research including Rogers (1975) Protection Motivation Theory (PMT), fear-as-acquired drive model (Hovland, Janis & Kelly, 1953), and parallel process model by Leventhal (1970). Witte (1992) extended these theories to match the empirical data of the time to postulate the EPPM to explain the relationship between use of a fear appeal in a health message and whether that message is accepted or avoided.

The model posits that two general outcomes are seen as a result of exposure to a fear-based message: message acceptance or message avoidance. These outcomes are generally determined at the control process followed based on the fear and efficacy conditions that the individual is exposed to. In the circumstance where a fear appeal is presented and the recipient of that message perceives high efficacy to manage it, a danger control process is employed leading to message acceptance. On the other hand, when a low perception of efficacy is present, a process is employed to simply manage the fear and strategies such as fatalism or denial is used to avoid the message. The extended parallel process model is illustrated in Figure 1.

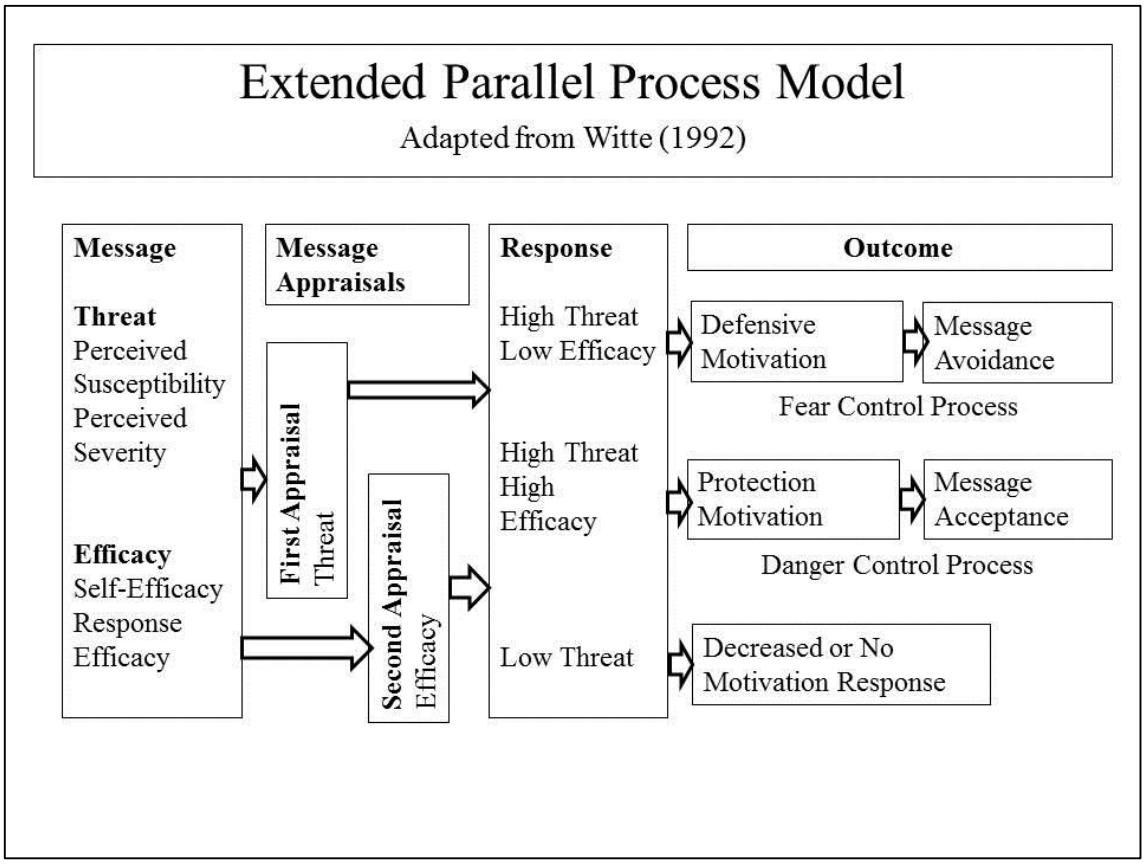


Figure 1: Extended parallel process model.

EPPM Applications in Health Education Research

Recent publications have reported the use of EPPM to drive research in a variety of health related interventions. EPPM has been used to target specific health issues such as drug abuse (Allahverdipour et al., 2007; Shi & Hazen, 2012), use of contraceptives (Campo, Askelson, Spies, & Losch, 2012), preventive dentistry (Askelson et al., 2012), HIV prevention (Bastien, 2011), asthma (Goei et al., 2010), disaster preparedness (Miller, Adame, & Moore, 2013), breast cancer screening (Hubbell, 2006; Ruiter, Verplanken, De Cremer & Kok, 2004), colorectal cancer screening (Kinney, Boonyasiriwat, Walters, Pappas et al, 2014), automobile speeding (Lewis, Watson &

White, 2010), smoking (Wong & Cappella, 2009), genetic risk (Etchegary & Perrier, 2007), cardiovascular disease (McKay, Berkowitz, Blumberg & Goldberg, 2004), and bulimia (Smalec & Klingle, 2000). Additionally, EPPM research has been done in a variety of target populations such as expectant mothers (Anderson, Harris, Kovarik, & Skelton, 2010), hospital workers (Balicer et al., 2010; Barnett et al., 2009; Barnet et al., 2010), disabled veterans (LaVela, Smith, & Weaver, 2007), seniors (Prati, Pietrantoni, & Zani, 2012), and physicians (Roberto, Goodall, West, & Mahan, 2010). Finally, EPPM has been studied among a variety of communication media such as video games (Chib, Lwin, Lee, Ng, & Wong, (2010), television (Hong, 2011) and educational brochures (Smith et al, 2008).

EPPM in Skin Cancer Prevention

The EPPM has been applied to skin cancer prevention and education programs as well. Stephenson and Witte (1998) studied how fear and efficacy appeals can be used in messaging to prevent skin cancer among college students using the EPPM. Rimal and Real (2003) used the EPPM in two skin cancer experiments to derive a Risk Perception Attitude (RPA) framework intending to classify individuals into attitudinal groups where tailored messages can be delivered. Also among college students, Cho and Salmon (2006) studied fear appeals across stages of behavior change based on the transtheoretical model among college students.

Millar and Houska (2007) used the model to examine how masculinity and fear interact in the context of skin cancer prevention messages among male college students. In a study of male and female college students (N=172), participants were grouped into

high and low masculine groups determined by self-report. They found that high masculine groups were more responsive at reporting intentions toward sun protection and self-screening behaviors when exposed to a fear reducing message. The authors suggest that fear reducing messages can be effectively tailored to characteristics of the target population.

The Feasibility Project

This project examined the feasibility of implementing a brief educational program in pools to manage risk behaviors of lifeguards with regard to skin cancer. The educational program had eight objectives based on constructs of the extended parallel process model and incorporated modules to examine the role of body image and implementation intentions interventions in reducing skin cancer risk.

Educational Objectives

Using each motivator from the EPPM, this program had specific objectives to be accomplished by the end of each session. Two objectives were established each for perceived susceptibility (Objectives 1 and 2), perceived severity (Objectives 3 and 4), perceived self-efficacy (Objectives 5 and 6) and perceived response efficacy (Objectives 7 and 8).

- Objective 1: By the end of the program, participants will be able to identify four ways they are at risk of UV radiation negatively impacting their health.
- Objective 2: By the end of the program, participants will be able to identify two ways they are at risk of UV radiation negatively impacting their appearance.

- Objective 3: By the end of the program, participants will be able to list three specific and serious health effects of skin cancer.
- Objective 4: By the end of the program, participants will be able to list two specific and serious appearance effects of skin cancer.
- Objective 5: By the end of the program, participants will be able to perform four actions to prevent skin cancer.
- Objective 6: By the end of the program, participants will be able to perform two actions to find skin cancer early.
- Objective 7: By the end of the program, participants will be able to identify four actions that effectively prevent skin cancer.
- Objective 8: By the end of the program, participants will be able to identify two actions that effectively detect skin cancer early.

Research Questions and Hypotheses

The research questions addressed in this feasibility project were to examine the role of a body image and implementation intentions intervention in reducing the risk of skin cancer among lifeguards. The program attempted to address the following questions and hypotheses.

- Question 1. What motivators and personal factors predict sun protective intentions and behaviors among adolescent and young adult lifeguards?
    - Hypothesis 1a: Appearance and health motives are positively related to and predict sun protection intentions and behaviors.

    - Hypothesis 1b: Barriers such as costs of sun protection and rewards of sun exposure are negatively related to and predict sun protection intentions and behaviors.
- Question 2. Does an implementation intentions intervention aid in identifying barriers and solutions to protective behaviors among adolescent and young adult lifeguards?

To answer these questions, test these hypotheses and assess the feasibility of implementing this educational program, a mixed-method study design was employed including a cross-sectional questionnaire and descriptive qualitative investigation.

Method

Recruitment. Participants were recruited from swimming facilities in Utah. Trained lifeguards are required to be 15 or 16 years old (depending on the training program) in order to have the necessary certification to work at a swimming facility. The research team contacted pool managers to introduce the study in April, 2013, through e-mail message and gave a short presentation at a pool manager staff meeting. In June 2013 and March 2014, pool managers were contacted again to arrange for a survey and educational program to be done at the swimming facilities for the lifeguard staff.

Inclusion criteria. In order to participate in this study, participants must:

- Be ages 15-25 at the beginning of the study.
- Male or Female.

- Be trained, certified and employed as a lifeguard at a public swimming facility in Utah.
- Have no personal history of skin cancer.

Participants who did not report meeting inclusion criteria were excluded from the study.

Educational Program

Gardner and Hatch (1989) developed a theory that intelligence can exist in several domains. These domains included areas such as logical-mathematical, spatial, interpersonal, intrapersonal, linguistic, musical, naturalistic and existential domains. Another domain he includes in his theory is bodily-kinesthetic where learning is most likely to occur in physical action and activity. It is likely that the athletic nature of lifeguarding with its rigorous physical requirements has a higher number of individuals with a high level of bodily-kinesthetic intelligence. The pedagogical approach assumes that appealing to bodily-kinesthetic intelligence is the most appropriate approach for providing educational messages to lifeguards.

Messages. To increase perceived threat and perceived efficacy, this program drew messages from the research literature with regard to skin cancer prevention and early detection. Messages intended to increase perceived threat included:

1) Identification of specific risk factors such as skin tone and hair color, personal and familial medical history and behaviors such as sun seeking and tanning bed use. (Susceptibility)

2) Understanding the deadliness of melanoma skin cancer in contrast to non-melanoma types. (Severity)

Messages intended to increase perceived threat on appearance:

1) UV radiation contributes to the skin aging process and appearance. (Susceptibility)
2) Skin cancer treatment can lead to significant impacts on skin and overall body appearance including scarring and disfigurement. (Severity)

Messages intended to increase perceived efficacy include:

1) Simplicity and accessibility of behaviors to prevent skin cancer including shade seeking, use of protective clothing, sunscreen use, wearing sunglasses, avoiding sun seeking, and avoiding tanning bed use. (Self Efficacy)
2) Simplicity and accessibility of performing early detection strategies including skin self-exams, partner skin exams and obtaining a full body skin exam from a dermatologist. (Self Efficacy)
3) Effectiveness of skin protective behaviors. (Response Efficacy)
4) Effectiveness of early detection strategies. (Response Efficacy)

Instructors. Instructors for this program were interns from the Huntsman Cancer Institute at the University of Utah. Interns and volunteers were currently undergraduate or graduate students in public health, health communication or community health promotion. Interns accepted into the program were required to apply for the position by submitting a resume and letters of recommendation and go through a rigorous interview process. Selected individuals were trained in how to implement the program.

Interns were given training in HIPAA compliance, human subject research and instructional methods to execute this program. The instructional methods program included 3 hours of face-to-face training provided by the principal investigator and included basic strategies of presenting, facilitating discussions and leading classroom activities. The interns received an instructors' manual with lesson plans, handouts and resources to conduct the training. As part of the training, interns saw all of the modules of the program and practice-taught an assigned module with feedback provided by peers and the principal investigator.

Design. As a mixed-method design, both a cross-sectional survey and qualitative evaluation of the implementation intention intervention worksheets were employed. For the cross-sectional survey, participants were given a questionnaire to complete prior to the delivery of the psychoeducational intervention. For the descriptive qualitative component, the worksheets used for the implementation intention intervention were collected and evaluated systematically for thematic elements relating to the central question (Question #2).

Study Procedures

Once approval from the University of Utah's Institutional Review Board was received, participants were recruited and consent/assent were obtained prior to program enrollment. Prior to the program's first lesson, participants completed a pretest questionnaire in person. Within 7 days of completing the pretest questionnaire, participants attended a 1-hour interactive presentation. For one pool, an implementation intentions intervention module was conducted with copies of the handouts collected for

analysis. For participants recruited in March 2014, only the survey was administered with a sun safety presentation scheduled later in the season.

Measures

The questionnaire measured personal factors including skin-type, appearance-related motives, tanning behaviors, sun-protective behaviors and perceived threat and efficacy using validated instruments from the literature. Demographic questions (e.g., age, gender) and screening questions (e.g., family history of skin cancer) were also included in the survey packet.

Skin-type. The Fitzpatrick skin-type scale (Fitzpatrick, 1998) is a single-item questionnaire that has participants rate the status of their skin after spending time in the sun. No psychometric data were provided by the author, however, the scale was used in two of the measures used in this study to determine skin type (Cafri et al., 2008; Mahler et al., 2003).

Tanning behaviors. Tanning behaviors were measured by a short scale that measures both UV and non-UV tanning methods (Lazovich et al., 2008). This scale had three mandatory items with an additional five items that are conditional based on responses in the first three. No psychometric data were provided with this scale.

Sun-protective behaviors. Sun-protective behaviors were measured with a modified scale based on a scale used by Azzarello, Dessureault, and Jacobsen (2006). This scale includes four items to measure sun protective behaviors with the addition of a question about the use of sunglasses by the investigator. The original scale showed a Cronbach's alpha score of .69.

Appearance and health threats, costs, rewards and efficacy. A scale by Mahler et al. (2003) will measure EPPM constructs. Cronbach alpha scores for these scales ranged from .70 and .96. A response efficacy scale was omitted due to a low Cronbach's alpha (α =.59) and to reduce the number of questions required of the participants.

Statistical Analysis

After data were entered and cleaned, missing data were addressed using mean substitution as appropriate. Scales were created and the internal consistency reliability of motivators and outcomes were evaluated. A correlation matrix was calculated to assess relationships between personal factors, motivators and outcome variables. Hierarchal regression analysis was used to evaluate effects of EPPM constructs measured and their relationships to outcome variables. SPSS 20.0 statistical software was used to analyze the data.

Power analysis. To determine sample size for the statistical models, a prospective power analysis using G*Power 3.1 (Faul, Erdfelder, Buchner & Lang, 2009) for R square change on a blocked multiple regression with 3 predictors tested of 9 total predictors of the model resulted in a recommended sample size of at least 77 to detect an effect size f^2 =.15, with error parameters of α=.05 and 1-β=.80. Additional lifeguards were recruited to ensure an adequate sample size to guarantee the power to detect this small of an effect.

Dissertation

This dissertation follows the three article format and includes three publishable articles for Chapters 2, 3 and 4. Chapter 2 is an applied article directed toward coaches, athletic directors and sport psychologists on the dangers of extended periods of sun exposure and tanning bed use. This paper will be submitted to the *Journal of Sport Psychology in Action*. Chapter 3 shares the results of the qualitative descriptive study on the barriers and solutions identified through the implementation intentions intervention. This article will be submitted to the *Journal of Cancer Education*. Chapter 4 reports the cross-sectional data examining how the EPPM constructs of relating to appearance and health threats predict sun protective behaviors. This article will be prepared for submission to *American Journal of Health Education.* Chapter 5 will provide a synthesis and summary of the research and a direction for how this feasibility project can be expanded to a full confirmatory study.

References

Abar, B. W., Turrisi, R., Hillhouse, J., Loken, E., Stapleton, J., & Gunn, H. (2010). Preventing skin cancer in college females: Heterogeneous effects over time. *Health Psychology, 29*(6), 574-582. doi: 2010-21226-001.

Allahverdipour, H., MacIntyre, R., Hidarnia, A., Shafii, F., Kzamnegad, A., Ghaleiha, A., & Emami, A. (2007). Assessing protective factors against drug abuse among high school students: Self-control and the extended parallel process model. *Journal of Addictions Nursing, 18*(2), 65-73. doi: 10.1080/10884600701334820.

Ambrose-Rudolph, C. M., Hofmann-Wellenhof, R., Richtig, E., Müller-Fürstner, M., Soyer, H. P., & Kerl, H. (2006). Malignant melanoma in marathon runners. *Archives of Dermatology, 142*(11), 1471-1474. doi: 10.1001/archderm.142.11.1471.

American Academy of Dermatology. (2012). *How Do I Prevent Skin Cancer?* Retrieved from http://www.aad.org/spot-skin-cancer/understanding-skin-cancer/how-do-i-prevent-skin-cancer/how-do-i-prevent-skin-cancer.

American Cancer Society (2013). Skin exams. *Skin Cancer Prevention and Early Detection.* Retrieved from http://www.cancer.org/cancer/skincancer-melanoma/moreinformation/skincancerpreventionandearlydetection/skin-cancer-prevention-and-early-detection-skin-exams.

American Cancer Society. (2014) *Cancer Facts and Figures 2014*. Retrieved from http://www.cancer.org/acs/groups/content/@research/documents/document/acspc-041770.pdf.

Anderson, C., Harris, M., Kovarik, R., & Skelton, J. (2010). Discovering expectant mothers' beliefs about oral health: An application of the Centering Pregnancy Smiles® program. *International Quarterly of Community Health Education, 30*(2), 115-140. doi: 10.2190/IQ.30.2.c.

Andersson, E. K., & Moss, T. P. (2011). Imagery and implementation intention: A randomised controlled trial of interventions to increase exercise behaviour in the general population. *Psychology of Sport and Exercise, 12*(2), 63-70.

Arbour, K. P., & Martin Ginis, K. A. (2009). A randomised controlled trial of the effects of implementation intentions on women's walking behaviour. *Psychology and Health, 24*(1), 49-65.

Askelson, N. M., Chi, D. L., Momany, E., Kuthy, R., Ortiz, C., Hanson, J. D., & Damiano, P. (2012). Encouraging early preventive dental visits for preschool-aged children enrolled in medicaid: Using the extended parallel process model to conduct formative research. *Journal of Public Health Dentistry,* article in press. doi: 10.1111/j.1752-7325.2012.00369.x.

Azzarello, L. M., Dessureault, S., & Jacobsen, P.B. (2006). Sun-protective behavior among individuals with a family history of melanoma. *Cancer Epidemiology, Biomarkers & Prevention, 15*, 142-145.

Balicer, R. D., Barnett, D. J., Thompson, C. B., Hsu, E. B., Catlett, C. L., Watson, C. M., . . . Links, J. M. (2010). Characterizing hospital workers' willingness to report to duty in an influenza pandemic through threat- and efficacy-based assessment. *BMC Public Health, 10.* doi: 10.1186/1471-2458-10-436.

Banerjee, S. C., Campo, S., & Greene, K. (2008). Fact or wishful thinking? Biased expectations in "I think I look better when I'm tanned." *American Journal of Health Behavior, 32*(3), 243-253.

Barnett, D. J., Balicer, R. D., Thompson, C. B., Storey, J. D., Omer, S. B., Semon, N. L., . . . Links, J. M. (2009). Assessment of local public health workers' willingness to respond to pandemic influenza through application of the extended parallel process model. *PLoS ONE, 4*(7). doi: 10.1371/journal.pone.0006365.

Barnett, D. J., Levine, R., Thompson, C. B., Wijetunge, G. U., Oliver, A. L., Bentley, M. A., . . . Balicer, R. D. (2010). Gauging U.S. emergency medical services workers' willingness to respond to pandemic influenza using a threat- and efficacy-based assessment framework. *PloS One, 5*(3). doi: 10.1371/journal.pone.0009856.

Bastien, S. (2011). Fear appeals in HIV-prevention messages: Young people's perceptions in northern Tanzania. *African Journal of AIDS Research, 10*(4), 435-449.

Berndt, N. C., O'Riordan, D. L., Winkler, E., McDermott, L., Spathonis, K., & Owen, N. (2011). Social cognitive correlates of young adult sport competitors' sunscreen use. *Health Education & Behavior, 38*(1), 6-14. doi: 10.1177/1090198110367996.

Brown, I., Sheeran, P., & Reuber, M. (2009). Enhancing antiepileptic drug adherence: A randomized controlled trial. *Epilepsy and Behavior, 16*(4), 634-639. doi: 10.1016/j.yebeh.2009.09.014.

Buller, D. B., Andersen, P. A., Walkosz, B. J., Scott, M. D., Maloy, J. A., Dignan, M. B., & Cutter, G. R. (2012). Compliance with sunscreen advice in a survey of adults engaged in outdoor winter recreation at high-elevation ski areas. *Journal of the American Academy of Dermatology, 66*(1), 63-70. doi: 10.1016/j.jaad.2010.11.044.

Cafri, G., Thompson, J. K., Jacobsen, P. B., & Hillhouse, J. (2009). Investigating the role of appearance-based factors in predicting sunbathing and tanning salon use. *Journal of Behavioral Medicine, 32,* 532-544. doi: 10.1007/s10865-009-9224-5.

Cafri, G., Thompson, J. K., Roehrig, M., Rojas, A., Sperry, S., Jacobsen, P. B., & Hillhouse, J. (2008). Appearance motives to tan and not tan: Evidence for validity and reliability of a new scale. *Annals of Behavioral Medicine, 35,* 209-220. doi: 10.1007/s12160-008-9022-2.

Cafri, G., Thompson, J. K., Roehrig, M., van den Berg, P., Jacobsen, P. B., & Stark, S. (2006). An investigation of appearance motives for tanning: The development and evaluation of the Physical Appearance Reasons for Tanning Scale (PARTS) and its relation to sunbathing and indoor tanning intentions. *Body Image, 3,* 199-209.

Campo, S., Askelson, N. M., Spies, E. L., & Losch, M. (2012). Ambivalence, communication and past use: Understanding what influences women's intentions to use contraceptives. *Psychology, Health and Medicine, 17*(3), 356-365. doi: 10.1080/13548506.2011.608432.

Chapman, J., & Armitage, C. J. (2012). Do techniques that increase fruit intake also increase vegetable intake? evidence from a comparison of two implementation intention interventions. *Appetite, 58*(1), 28-33. doi: 10.1016/j.appet.2011.09.022.

Chapman, J., Armitage, C. J., & Norman, P. (2009). Comparing implementation intention interventions in relation to young adults' intake of fruit and vegetables. *Psychology and Health, 24*(3), 317-332. doi: 10.1080/08870440701864538.

Chib, A. I., Lwin, M. O., Lee, Z., Ng, V. W., & Wong, P. H. P. (2010). Learning AIDS in singapore: Examining the effectiveness of HIV/AIDS efficacy messages for adolescents using ICTs. *Knowledge Management and E-Learning, 2*(2), 169-187.

Cho, H., Hall, J. G., Kosmoski, C., Fox, R. L., & Mastin, T. (2010). Tanning, skin cancer risk, and prevention: A content analysis of eight popular magazines that target female readers, 1997-2006. *Health Communication, 25*(1), 1-10. doi: 10.1080/10410230903265938.

Cho, H., & Salmon, C. T. (2006). Fear appeals for individuals in different stages of change: Intended and unintended effects and implications on public health campaigns. *Health Communication, 20*(1), 91-99.

Cohen, P. H., Tsai, H., & Puffer, J. C. (2006). Sun-protective behavior among high-school and collegiate athletes in Los Angeles, CA. *Clinical Journal of Sport Medicine, 16*(3), 253-260.

de Nooiier, J., Jansen, R., & van Assema, P. (2012). The use of implementation intentions to promote vitamin D supplementation in young children. *Nutrients, 4*(10), 1454-1463. doi: 10.3390/nu4101454.

De Vet, E., Oenema, A., Sheeran, P., & Brug, J. (2009). Should implementation intentions interventions be implemented in obesity prevention: The impact of if-then plans on daily physical activity in Dutch adults. *International Journal of Behavioral Nutrition and Physical Activity, 6,* 11. doi: 10.1186/1479-5868-6-11.

Devita, V. T. Lawrence, T. S., & Rosenberg, S. A. (2011) *Cancer: Principles & practice of oncology, 9th Ed.* Philadelphia, PA: Lippencott Williams & Wilkins.

Dixon, H., Dobbinson, S., Wakefield, M., Jamsen, K., & McLeod, K. (2008). Portrayal of tanning, clothing fashion and shade use in Australian women's magazines, 1987-2005. *Health Educator Research, 23*(5), 791-802.

Downs, N., Parisi, A., & Schouten, P. (2011). Basal and squamous cell carcinoma risks for golfers: An assessment of the influence of tee time for latitudes in the northern and southern hemispheres. *Journal of Photochemistry and Photobiology B: Biology, 105*(1), 98-105. doi: 10.1016/j.jphotobiol.2011.07.007.

Etchegary, H., & Perrier, C. (2007). Information processing in the context of genetic risk: Implications for genetic-risk communication. *Journal of Genetic Counseling, 16*(4), 419-432.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41,* 1149-1160. doi: 10.3758/BRM.41.4.1149.

Fitzpatrick, T. B. (1975). Soleil et paeu. *Journal of Medical Esthetics, 2,* 33-34.

Gardner, H., & Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. *Educational Researcher, 18*(8), 4-9.

Gies, P., Glanz, K., O'Riordan, D., Elliott, T., & Nehl, E. (2009). Measured occupational solar UVR exposures of lifeguards in pool settings. *American Journal of Industrial Medicine, 52,* 645-653. doi:10.1002/ajim.20722.

Goei, R., Boyson, A. R., Lyon-Callo, S. K., Schott, C., Wasilevich, E., & Cannarile, S. (2010). An examination of EPPM predictions when threat is perceived externally: An asthma intervention with school workers. *Health Communication, 25*(4), 333-344. doi: 10.1080/10410231003775164.

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist, 54,* 493-503.

Hagger, M. S., Lonsdale, A., & Chatzisarantis, N. L. D. (2012). A theory-based intervention to reduce alcohol drinking in excess of guideline limits among undergraduate students. *British Journal of Health Psychology, 17*(1), 18-43. doi: 10.1111/j.2044-8287.2010.02011.x.

Hall, D. M., Elliott, T., Nehl, E., & Glanz, K. (2008). Effectiveness of a targeted, peer-driven skin cancer prevention program for lifeguards. *International Journal of Aquatic Research and Education, 2,* 287-297.

Hillhouse, J., Turrisi, R., Stapleton, J., & Robinson, J. (2008). A randomized controlled trial of an appearance focused intervention to prevent skin cancer. *Cancer, 113*(11), 3257-3266. doi: 10.1002/cncr.23922.

Hillhouse, J., Turrisi, R., Stapleton, J., & Robinson, J. (2010). Effect of seasonal affective disorders and pathological tanning motives on efficacy of an appearance-focused intervention to prevent skin cancer. *Archives of Dermatology, 146*(5), 485-491. doi: 10.1001/archdermatol.2010.85.

Hong, H. (2011). An extension of the extended parallel process model (EPPM) in television health news: The influence of health consciousness on individual message processing and acceptance. *Health Communication, 26*(4), 343-353. doi: 10.1080/10410236.2010.551580.

Hovland, C., Janis, I., & Kelly, H. (1953). *Communication and persuasion*. New Haven, CT: Yale University Press.

Hubbell, A. P. (2006). Mexican American women in a rural area and barriers to their ability to enact protective behaviors against breast cancer. *Health Communication, 20,* 35-44.

International Commission on Non-Ionizing Radiation Protection, ICNIRP. (1999). Guidelines on limits of exposure to ultraviolet radiation of wavelengths between 180 nm and 400 nm. In Matthes, R., Bernhardt, J., McKinlay, A. (Eds.), *Guidelines on limiting exposure to non-ionizing radiation.* Munich: Markl-Druck.

Jackson, C., Lawton, R., Knapp, P., Raynor, D. K., Conner, M., Lowe, C., & José Closs, S. (2005). Beyond intention: Do specific plans increase health behaviours in patients in primary care? A study of fruit and vegetable consumption. *Social Science and Medicine, 60*(10), 2383-2391.

Jackson, C., Lawton, R. J., Raynor, D. K., Knapp, P., Conner, M. T., Lowe, C. J., & Closs, S. J. (2006). Promoting adherence to antibiotics: A test of implementation intentions. *Patient Education and Counseling, 61*(2), 212-218.

Kasparian, N. A., McLoone, J. K., & Meiser, B. (2009). Skin cancer-related prevention and screening behaviors: A review of the literature. *Journal of Behavioral Medicine. 32,* 406-428. doi: 10.1007/s10865-009-9219-2.

Kinney, A.Y., Boonyasiriwat, W., Walters, S.T., Pappas, L.M., Stroup, A.M., Schwartz, M.D., …& Higginbotham, J.C. (2014). Telehealth personalized cancer risk communication to motivate colonoscopy in relatives of patients with colorectal cancer: the family CARE randomized controlled trial. *Journal of Clinical Oncology, 32*(7), 654-662. doi: 10.1200/JCO.2013.51.6765.

Laffargue, J. A., Merediz, J., Buhan, M. M., & Pierini, A. M. (2011). Sun protection questionnaire in Buenos Aires adolescent athletes. *Archivos Argentinos de Pediatria, 109*(1), 30-35. doi: 10.1590/S0325-00752011000100008.

Lazovich, D., Stryker, J. E., Mayer, J. A., Hillhouse, J., Dennis, L. K., Pichon, L., Pagoto, S.,… Thompson, K. (2008). Measuring nonsolar tanning behavior. *Archives of Dermatology, 144*(2), 225-230. doi: 10.1001/archdermatol.2007.45.

LaVela, S. L., Smith, B., & Weaver, F. M. (2007). Perceived risk for influenza in veterans with spinal cord injuries and disorders. *Rehabilitation Psychology, 52*(4), 458-462.

Leventhal, H. (1970). Findings and theory in the study of fear communications. In L. Berkowitz (Ed.), *Advances in experimental social psychology, 5,* 119-186.

Lewis, I. M., Watson, B. C., & White, K. M. (2010). Response efficacy: The key to minimizing rejection and maximizing acceptance of emotion-based anti-speeding messages. *Accident Analysis & Prevention, 42,* 459-467.

Mahler, H. I.M., Kulik, J. A., Gibbons, F. X., Gerrard, M., & Harrell, J. (2003). Effects of appearance-based interventions on sun protection intentions and self-reported behaviors. *Health Psychology, 22*(2), 199-209.

McKay, D. L., Berkowitz, J. M., Blumberg, J. B., & Goldberg, J. P. (2004). Communicating cardiovascular disease risk due to elevated homocysteine levels: Using the EPPM to develop print materials. *Health Education and Behavior, 31*(3), 355-371.

Merten, J.W., Higgins, S., Rowan, A., & Pragle, A. (2014). Sun safety knowledge, attitudes and behaviors among beachgoing adolescents. *American Journal of Health Education, 45,* 37-41. doi: 10.1080/19325037.2013.852997

Millar, M. G., & Houska, J. (2007). Masculinity and intentions to perform health behaviors: The effectiveness of fear control arguments. *Journal of Behavioral Medicine, 30,* 21-35.

Miller, C. H., Adame, B. J., & Moore, S. D. (2013). Vested interest theory and disaster preparedness. *Disasters, 37*(1), 1-27. doi: 10.1111/j.1467-7717.2012.01290.x.

Moehrle, M. (2001). Ultraviolet exposure in the ironman triathlon. *Medicine and Science in Sports and Exercise, 33*(8), 1385-1386.

Moehrle, M., Heinrich, L., Schmid, A., & Garbe, C. (2000). Extreme UV exposure of professional cyclists. *Dermatology, 201*(1), 44-45.

Mosher, C. E., & Danoff-Burg, S. (2010). Addiction to indoor tanning. *Archives of Dermatology, 146*(4), 412-417. doi: 10.1001/archdermatol.2009.385.

National Cancer Institute. (2012.) *Skin Cancer Prevention PDQ.* Retrieved from http://www.cancer.gov/cancertopics/pdq/prevention/skin/Patient.

Phillips, K. A., Conroy, M., Dufresne, R. G., Mernard, W., Didie, E. R., Hunter-Yates, J., … & Pagano, M. (2006). Tanning in body dysmorphic disorder. *Psychiatry Quarterly, 77*(2), 129-138.

Prati, G., Pietrantoni, L., & Zani, B. (2012). Influenza vaccination: The persuasiveness of messages among people aged 65 years and older. *Health Communication, 27*(5), 413-420. doi: 10.1080/10410236.2011.606523.

Prestwich, A., Conner, M., Lawton, R., Bailey, W., Litman, J., & Molyneaux, V. (2005). Individual and collaborative implementation intentions and the promotion of breast self-examination. *Psychology and Health, 20*(6), 743-760.

Reed, K. B., Brewer, J. D., Lohse, C. M., Bringe, K. E., Pruitt, C. N., & Gibson, L. E. (2012). Increasing incidence of melanoma among young adults: An epidemiological study in Olmstead County, Minnesota. *Mayo Clinic Proceedings, 87*(4), 328-334. doi:10.1016/j.mayocp.2012.01.010.

Reilly, A., & Rudd, N. A. (2008). Sun, salon and cosmetic tanning: Predictors and motives. *International Journal of Humanities and Social Sciences, 2*(3), 170-176.

Reynolds, D. (2007). Literature review of theory-based empirical studies examining adolescent tanning practices. *Dermatology Nursing, 19*(5), 440-447.

Rimal, R. N. & Real, K. (2003). Perceived risk and efficacy beliefs as motivators of change: Use of the risk perception attitude (RPA) framework to understand health behaviors. *Human Communication Research, 29,* 370-399. doi: 10.1111/j.1468-2958.2003.tb00844.x.

Roberto, A. J., Goodall, C. E., West, P. M., & Mahan, J. D. (2010). Persuading physicians to test their patients' level of kidney functioning: The effects of message frame and point of view. *Health Communication, 25*(2), 107-118. doi: 10.1080/10410230902544902.

Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology, 91*, 93-114.

Ruiter, R., Verplanken, B., De Cremer, D., & Kok, G. (2004). Danger and fear control in response to fear appeals: The role of need for cognition. *Basic and Applied Social Psychology, 26,* 13-24.

Rutter, D. R., Steadman, L., & Quine, L. (2006). An implementation intentions intervention to increase uptake of mammography. *Annals of Behavioral Medicine, 32*(2), 127-134.

Serrano, M. A., Cañada, J., & Moreno, J. C. (2010). Erythemal ultraviolet exposure of cyclists in Valencia, Spain. *Photochemistry and Photobiology, 86*(3), 716-721. doi: 10.1111/j.1751-1097.2009.00693.x.

Sheeran, P., & Orbell, S. (2000). Using implementation intentions to increase attendance for cervical cancer screening. *Health Psychology, 19*(3), 283-289.

Shi, R., & Hazen, M. D. (2012). Applying the extended parallel process model to examine posters in the 2008 Chinese annual anti-drug campaign. *Journal of Asian Pacific Communication, 22*(1), 60-77.

Skin Cancer Foundation. (2012). *Skin Cancer Facts.* Retrieved from http://www.skincancer.org/skin-cancer-information/skin-cancer-facts.

Smalec, J. L., & Klingle, R. S. (2000). Bulimia interventions via interpersonal influence: The role of threat and efficacy in persuading bulimics to seek help. *Journal of Behavioral Medicine, 23,* 37-57.

Smith, S. W., Rosenman, K. D., Kotowski, M. R., Glazer, E., McFeters, C., Keesecker, N. M., & Law, A. (2008). Using the EPPM to create and evaluate the effectiveness of brochures to increase the use of hearing protection in farmers and landscape workers. *Journal of Applied Communication Research, 36*(2), 200-218.

SooHoo, S., Reel, J. J., & Pearce, P. F. (2011). Socially constructed body image of female adolescent cheerleaders. *Women in Sport and Physical Activity Journal, 20*(2), 22-34.

Steadman, L., & Quine, L. (2004). Encouraging young males to perform testicular self-examination: A simple, but effective, implementation intentions intervention. *British Journal of Health Psychology, 9*(4), 479-487. doi: 10.1348/1359107042304551.

Stephenson, M. T. & Witte, K. (1998). Fear, threat and perceptions of efficacy from frightening skin cancer messages. *Public Health Reviews, 26*(2), 147-174.

Team, V. & Markovic, M. (2006). Internet advertising of artificial tanning in Australia. *European Journal of Cancer Prevention, 15*, 371-376.

U.S. Preventive Services Task Force (2009). Screening for skin cancer: Recommendation statement. *Annals of Internal Medicine, 150,* 188-93.

van Osch, L., Reubsaet, A., Lechner, L., & de Vries, H. (2008). The formation of specific action plans can enhance sun protection behavior in motivated parents. *Preventive Medicine, 47*, 127-132. doi: 10.1016/j.ypmed.2009.02.025.

Winett, R. A., Cleaveland, B. L., Tate, D. F., Lombard, D. N., Lombard, T. N., Russ, C. R., & Galper, D. (1997). The effects of the Safe-sun program on patrons' and lifeguards' skin cancer risk-reduction behaviors at swimming pools. *Journal of Health Psychology, 2,* 85-95. doi: 10.1177/135910539700200109.

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs, 59*, 329-349.

Wolff, T., Tai, E. & Miller, T. (2009). Screening for skin cancer: An update of the evidence for the U.S. Preventive Services Task Force. *Annals of Internal Medicine, 150*(3), 194-198. doi: 10.7326/0003-4819-150-3-200902030-00008.

Wong, N. C. H., & Cappella, J. N. (2009). Anti-smoking threat and efficacy appeals: Effects on smoking cessation intentions for smokers low and high in readiness to quit. *Journal of Applied Communication Research, 37,* 1-20.

Wysong, A., Gladstone, H., Kim, D., Lingala, B., Copeland, J., & Tang, J. Y. (2012). Sunscreen use in NCAA collegiate athletes: Identifying targets for intervention and barriers to use. *Preventive Medicine, 55,* 493-496. doi: 10.1016/j.ypmed.2012.08.020.

Yoo, J.J. (2009). Peer influence on adolescent boys' appearance management behaviors. *Adolescence, 44*(176), 1017-1031.

CHAPTER 2

SKIN CANCER RISK AND ATHLETES: STRATEGIES FOR PREVENTING A DEADLY DISEASE

Abstract

Although healthy in many ways, the sport environment is not immune to the dangers that excessive UV exposure poses in regard to the risk of skin cancer. This paper discusses the role that coaches, sport psychologists and administrators have in creating a sport environment that promotes skin health. Four strategies are provided to guide sport professionals in developing a comprehensive skin health program for their athletes.

Skin Cancer Risk and Athletes: Strategies for Preventing a Deadly Disease

This article provides athletes, coaches, sport psychologists and other athletic professionals with information about skin cancer, and four simple keys to make the sport environment healthier for the athlete's skin. The three most common types of skin cancers are basal cell carcinoma (BCC), squamous cell carcinoma (SCC) and melanoma (National Cancer Institute, 2012). Of the three types, melanoma is the least prevalent,

but the most severe. As melanoma has unique characteristics, the major types of skin cancers are generally classified as melanoma and nonmelanoma skin cancers.

Nonmelanoma skin cancers combine to be the most common type of cancer in the world. The American Cancer Society (2013a) estimates that there will be approximately 3.5 million new diagnoses of nonmelanoma skin cancer in the United States this year alone. Although nonmelanoma cancers are common and slow growing, thousands of patients die each year from neglected skin cancers that spread to and interfere with vital organs of the body. Nonmelanoma skin cancers typically are not painful and can appear as small, smooth, shiny bumps on the skin or flat, rough and scaly areas.

Melanoma skin cancer is far less common than nonmelanoma skin cancer however, it is much more aggressive and severe. The American Cancer Society (2013a) estimates that approximately 76,000 new cases of melanoma will be diagnosed in the United States this year. Unlike the nonmelanoma type, it is estimated to cause 10,000 deaths in the United States in 2013. Melanoma typically appears as a changing mole that is unlike other moles on the skin. Although melanoma is often located on areas of the skin with significant sun exposure, it is common to find melanoma anywhere on the body. (National Cancer Institute, 2012)

Risk Factors

Common risk factors for all types of skin cancer include behavioral, personal and hereditary factors. Behavioral factors include exposure to UV radiation through sunlight or artificial tanning beds, personal factors including fair skin that burns easily,

green, blue or gray eyes, blond or red hair and have a large number of freckles on the skin. Having a medical history of severe sunburn, suppressed immunity or the use of certain antibiotics, hormones and antidepressants also increase the risk of developing skin cancer. Melanoma can also be linked to a personal or family history of melanoma or other inherited skin conditions. (National Cancer Institute, 2012)

Prevention and Early Detection

The American Academy of Dermatology (2012) recommends five behaviors for preventing skin cancer. These steps include seeking shade during peak hours, wearing protective clothing, applying broad spectrum sunscreen frequently and generously, using extra caution around water, sand and snow and avoiding intentional tanning. Early detection activities revolve around regular skin checks that can be performed individually, by a partner or by a dermatologist. The American Cancer Society (2013b) recommends that individuals talk with a dermatologist about how often they should examine their own skin and see a doctor for a full-body skin examination. In performing an exam, individuals should remember the ABCDEs of what to look for in examining a mole. These include looking for moles that are (A) asymmetrical, have an unusual (B) border, have more than one (C) color, have a (D) diameter larger than 6 mm or are (E) evolving or changing in any way. Any moles that meet any of these criteria should be assessed by a dermatologist.

Skin Cancer Risk Factors and Athletes

In a multisport survey of National Collegiate Athletic Association (NCAA) athletes (*N*=290) at two major universities, Wysong et al. (2012) found that athletes spent an average of 4 hours per day in the sun; however, sunscreen was not used on a regular basis. Wysong et al. found that only 50% of student-athletes reported using sunscreen at all and 25% of athletes used sunscreen only three times each week. The authors concluded that the following factors increase the likelihood of wearing sunscreen; being female, having recent sunburns, having a fear of skin cancer, sunburn and wrinkles as well as knowing someone with skin cancer.

Berndt et al. (2010) also found low use and insufficient application of sunscreen among athletes. Berndt et al. conducted a study on young adults ages 18 to 30 competing in soccer (*N*=65), surf-lifesaving (*N*=63), hockey (*N*=61), and tennis (*N*=48). Athletes were surveyed about their use of sunscreen at their last competition on a sunny day. Interestingly, 29.5% of these young adults reported that they did not use sunscreen while 47.3% of respondents reported inadequate use (i.e., failure to apply sunscreen 30 minutes prior to sun exposure, reapplying every 2 hours) that day. Additionally, the investigators found risk perceptions to be predictive of sunscreen use leading to the conclusion that behavioral interventions should be geared around reducing barriers to use and increasing a sense of personal relevance of sunscreen use.

Ambrose-Rudolf et al. (2006) found that a sample of competitive runners (*N*=210) had more atypical moles compared to a control group of a similar age and sex and observed an association with intensity of training. These findings led to the authors recommending that runners choose training and competition schedules at times of the

day that tend to yield lower UV levels and to wear appropriate protective clothing and sunscreen regularly. In a separate study (Moehrle, 2001) among Ironman triathletes (*N*=3), dosimeters (devices used to measure amounts of UV radiation) recorded UV radiation exposure levels to exceed 30 times the levels set by the International Commission for Non-Ionizing Radiation Protection and the American Conference of Governmental Industrial Hygienists.

Dosimetry studies (Serrano, Canada & Moreno, 2010; Moehrle, Heinrich, Schmid & Garbe, 2000) have further confirmed the high amounts of UV radiation exposure that elite athletes experience. In a small study among cyclists (*N*=5) high UV exposure was recorded using dosimetry over two, 4-day periods in Spain (Serrano, et al. 2010). The dosimeters recorded levels of UV radiation exceeding occupational and recreational guidelines during summer and winter months. Moehrle et al. (2000) found excessive UV exposure using dosimeters on a sample of cyclists (*N*=8) competing in a race in Switzerland. As with the study among Ironman competitors, dosimeters recorded UV radiation levels exceeding international limits by 30 times over the all eight stages of the race.

Winter sport athletes may also have an increased risk for skin cancer. Buller et al. (2011) conducted a cross sectional survey study among adult skiers and snowboarders (*N*=4,837) and found that only 4.4% of participants reported full compliance with sunscreen recommendations. Although 73.2% of those who reported applying sunscreen appropriately applied it 30 minutes prior to sun exposure, only 20.4% effectively reapplied sunscreen as recommended.

Tanning Among Athletes

While studies have found that athletes receive sun exposure as a product of competing in winter and summer sports, some athletes were found to purposively engage in sun-seeking behaviors (e.g., tanning beds) to obtain a bronzed appearance. For example, Cohen, Tsai and Puffer and colleagues (2006) surveyed high school and collegiate athletes in Los Angeles (*N*=1,006) about their sun protective behaviors and demonstrated that athletes in both the university and high school settings were at higher risk for increased exposure to UV radiation. Moreover, these athletes were less likely to wear protective clothing (e.g., long shirts and long pants) but did wear hats and sunscreen more often than their control group counterparts. Among university athletes, more indoor and outdoor tanning behaviors were observed compared to controls.

In an interview-based study among teenage cheerleaders, SooHoo, Reel and Pearce (2011) considered body comparison with peers by citing an example of one respondent comparing herself with others in her peer group. This respondent spoke in terms of the evenness and depth of the tans that fellow cheerleaders worked toward. Although tanned skin does not emerge as a major theme in their study, the comparison to others in the peer group was a key factor in the construction of one's perception of appearance norms within the peer group.

Strategies for Prevention

Coaches, athletes and sport psychologists can make great steps at improving the sport environment toward skin health. Based on the evidence, we propose four strategies to successfully implement a plan to minimize risk of developing skin cancer

among athletes while still staying competitive. These strategies include minimizing sun exposure, protecting the skin while in training, practice and competition, managing behavior away from the sport environment and catching suspicious spots early.

Strategy 1: Minimize Sun Exposure

Practice/Competition times. Downs, Parisi and Schouten (2011) calculated the amounts of UV radiation by sun angle across latitudes and to assess the risk association of weekly tee times on golf courses. Their findings suggest that golfers who held tee times in the mid- to late morning hours had the greatest risk for skin cancer. These findings about golfers support the generalization of findings to other sports (e.g., football, baseball, soccer, cross country) conducted on a grassy surface. The Skin Cancer Foundation (2012) extends these findings to include peak hours between 10:00 a.m. and 4:00 p.m. as times of the day to avoid excessive time in the sun.

When scheduling outdoor competitions, practices and training sessions, it is critical to consider how much time during that interval athletes will spend outdoors. Arranging team meeting time, film study, and weight training during parts of practice or training sessions that overlap the peak hours to indoor or shaded settings can provide protection for the skin when the sun's rays are strongest.

Shade structures. Although it may be difficult to schedule practices or competitions outside of peak UV hours, sport professionals still have a number of options when striving to create a safer athletic environment. Small portable canopies are fairly inexpensive and can be easily set up and placed around water facilities or sidelines for athletes not participating immediately on the field. Other options include

locating shady areas next to buildings or bleachers for conducting drills and conditioning exercises.

Strategy 2: Protect the Skin

Uniforms. The Skin Cancer Foundation (2012) recommends clothing as the most effective form of protection from the sun. When considering the uniforms that athletes will be wearing, clothing that covers the most skin is recommended. Some clothing manufacturers have lines of outdoor clothing and uniforms that include UV protective materials.

For indoor competitors, uniforms may also play a role in skin protection. Competitors in sports where uniforms traditionally do not cover the skin that street clothes cover may display tan lines that may cause athletes to feel insecure. This may lead to sun seeking or tanning behaviors to remedy the insecurity or comments from other players or spectators.

Similarly, athletes who train and compete in a specific uniform may use the shape and depth of the tan pattern of their skin as a badge of honor of the work put in. Coaches and sport psychologists can remind athletes to focus on the improvements in performance rather than on appearance.

Sunscreen. The American Cancer Society (2013), National Cancer Institute (2012), and American Academy of Dermatology (2012) all recommend sunscreen as a key component of a sun protection strategy. The American Academy of Dermatology (2012) recommends pre-application of sunscreen 30 minutes prior to exposure and reapplying frequently, at least every 2 hours.

Providing athletes with sunscreen can be expensive, however, by partnering with local health departments, dermatology offices or melanoma advocacy groups, opportunities for small grants may allow bulk purchasing of sunscreen for school district athletic programs or university athletic departments making sunscreen more affordable or even free.

Sunglasses. It is also important to recognize that skin cancer may also develop in the eye (National Cancer Institute, 2012). UV resistant sunglasses may not be appropriate during competition, but athletes not actively engaged in competition either during training or practice or while waiting on the bench, may benefit from policies and practices that allow sunglass use.

Strategy 3: Thinking Off the Field, Court, Pitch, Gym and Ring

Stapleton, Turrisi and Hillhouse (2008) found that tanning bed use is positively correlated to peer group tanning bed use. Their findings indicate that tanning bed use is most common among popular peer crowds where athletes often are included. Among females, Cafri, Thompson, Jacobsen, and Hillhouse (2009) found that tanning behaviors were highly predicted by attitudes toward appearance in a sample of college aged women. The findings also suggest that sociocultural influences (media, family, friends) toward tanning strongly predict intentions. Danoff-Burg and Mosher (2006) identified that frequent tanners find the behavior relaxing and a way to socialize in addition to enhancing appearance.

These findings are not unique to young women. In a study with teenage boys, Yoo (2009) found that peer influences led to tanning and other appearance related

behavior, even though the boys perceived the behavior as being unhealthy. Similarly, in a study among bodybuilders, body dissatisfaction has been shown to predict tanning bed use as well as a variety of other self-destructive behaviors relative to homonegativity (Reilly, 2004). Additional work from Reilly and Rudd (2008) reveals that negative body image, low self-esteem, internalized homophobia and a desire to socialize predict tanning bed use among gay men. Sport psychologists and counselors should understand how excessive tanning may be a symptom of complex and deeper concerns. Phillips et al. (2006) found that tanning behavior was a common symptom of body dysmorphic disorder showing strong relationships to skin dissatisfaction and functional impairments due to body dysmorphic disorder. These findings were consistent between males and females.

Strategy 4: Early Detection

In many cases, skin cancer is unavoidable. When cancer develops it is best to recognize it quickly and get it diagnosed when it is most treatable. As mentioned before, self, partner or physician screening can be a helpful means of identifying skin cancer before it grows too deeply where treatment would be difficult or disfiguring or before it spreads where it can interfere with other organ systems.

Self screening. Self-screening exams are easy to teach and to perform. Inviting a local dermatologist, nurse or health educator to a team meeting can be an effective way of helping athletes understand the basic steps of self-exams and what to look for. Coaches and sport psychologists can follow up with athletes, particularly those at highest risk, about their skin health and remind them to keep an eye on their skin.

Physician screening**.** Although self-screening is important, there is no substitute for the trained and experienced eye of a medical professional. A dermatologist can evaluate areas of concern and recommend whether more diagnostic tests are needed. Most dermatologists perform full body screening exams for their patients by appointment in their offices.

The American Academy of Dermatology (2013) provides a list of free skin cancer screening events throughout the United States on its website. These sanctioned free screening events are often public services provided by dermatology offices or cancer hospitals in local areas. These are excellent opportunities for individuals without a health care provider or insurance to be screened and educated by a dermatologist. Some dermatologists are willing to provide screenings for schools and workplaces. Coaches and other sport professionals may contact dermatologists in their area to find out if a dermatologist is willing to provide a screening for sports teams and athletic departments.

Conclusion

In conclusion, the athletic environment can pose unique challenges in maintaining healthy skin and preventing skin cancer. The risk for developing skin cancer may be higher among athletes due to a number of factors, however, risk can be greatly reduced by reducing time spent in the sun, protecting the skin from the sun's harmful rays with sunscreen and protective clothing, considering the athlete's behaviors outside of the sport environment and helping athletes develop strategies and habits to find cancer early. By following four key strategies, sport psychologists, coaches,

trainers and administrators can create an environment that fosters safer skin health practices.

References

Ambrose-Rudolph, C. M., Hofmann-Wellenhof, R., Richtig, E., Müller-Fürstner, M., Soyer, H. P., & Kerl, H. (2006). Malignant melanoma in marathon runners. *Archives of Dermatology, 142*(11), 1471-1474. doi: 10.1001/archderm.142.11.1471.

American Academy of Dermatology. (2012). *How Do I Prevent Skin Cancer?* Retrieved from http://www.aad.org/spot-skin-cancer/understanding-skin-cancer/how-do-i-prevent-skin-cancer/how-do-i-prevent-skin-cancer.

American Cancer Society. (2013a). *Cancer Facts and Figures 2013.* Retrieved from http://www.cancer.org/acs/groups/content/@epidemiologysurveilance/documents/document/acspc-036845.pdf.

American Cancer Society (2013b). Skin exams. *Skin Cancer Prevention and Early Detection.* Retrieved from http://www.cancer.org/cancer/skincancer-melanoma/moreinformation/skincancerpreventionandearlydetection/skin-cancer-prevention-and-early-detection-skin-exams.

Berndt, N. C., O'Riordan, D. L., Winkler, E., McDermott, L., Spathonis, K., & Owen, N. (2011). Social cognitive correlates of young adult sport competitors' sunscreen use. *Health Education & Behavior, 38*(1), 6-14. doi: 10.1177/1090198110367996.

Buller, D. B., Andersen, P. A., Walkosz, B. J., Scott, M. D., Maloy, J. A., Dignan, M. B., & Cutter, G. R. (2012). Compliance with sunscreen advice in a survey of adults engaged in outdoor winter recreation at high-elevation ski areas. *Journal of the American Academy of Dermatology, 66*(1), 63-70. doi: 10.1016/j.jaad.2010.11.044.

Cafri, G., Thompson, J. K., Jacobsen, P. B., & Hillhouse, J. (2009). Investigating the role of appearance-based factors in predicting sunbathing and tanning salon use. *Journal of Behavioral Medicine, 32,* 532-544. doi: 10.1007/s10865-009-9224-5.

Cohen, P. H., Tsai, H., & Puffer, J. C. (2006). Sun-protective behavior among high-school and collegiate athletes in Los Angeles, CA. *Clinical Journal of Sport Medicine, 16*(3), 253-260.

Danoff-Berg, S. & Mosher, C.E. (2006). Predictors of tanning salon use: Behavioral alternatives for enhancing appearance, relaxing and socializing. *Journal of Health Psychology, 11*(3), 511-518. doi: 10.1177/1359105306063325.

Downs, N., Parisi, A., & Schouten, P. (2011). Basal and squamous cell carcinoma risks for golfers: An assessment of the influence of tee time for latitudes in the northern and southern hemispheres. *Journal of Photochemistry and Photobiology B: Biology, 105*(1), 98-105.

Moehrle, M. (2001). Ultraviolet exposure in the ironman triathlon. *Medicine and Science in Sports and Exercise, 33*(8), 1385-1386. doi: 10.1097/00005768-200108000-00021.

Moehrle, M., Heinrich, L., Schmid, A., & Garbe, C. (2000). Extreme UV exposure of professional cyclists. *Dermatology, 201*(1), 44-45. doi: 10.1159/000018428.

National Cancer Institute. (2012). *Skin Cancer Prevention PDQ.* Retrieved from http://www.cancer.gov/cancertopics/pdq/prevention/skin/Patient.

Phillips, K. A., Conroy, M., Dufresne, R. G., Mernard, W., Didie, E. R., Hunter-Yates, J., … & Pagano, M. (2006). Tanning in body dysmorphic disorder. *Psychiatry Quarterly, 77*(2), 129-138. doi: 10.1007/s11126-006-9002-2.

Reilly, A. (2004). *Risk, Body Image, and Internalized Homonegativity among Gay Men*. (Unpublished doctoral dissertation). The Ohio State University. Colombus, OH.

Reilly, A., & Rudd, N. A. (2008). Sun, salon and cosmetic tanning: Predictors and motives. *International Journal of Humanities and Social Sciences, 2*(3), 170-176.

Serrano, M. A., Cañada, J., & Moreno, J. C. (2010). Erythemal ultraviolet exposure of cyclists in Valencia, Spain. *Photochemistry and Photobiology, 86*(3), 716-721. doi: 10.1111/j.1751-1097.2009.00693.x.

Skin Cancer Foundation. (2012). *Skin Cancer Facts.* Retrieved from http://www.skincancer.org/skin-cancer-information/skin-cancer-facts.

SooHoo, S., Reel, J. J., & Pearce, P. F. (2011). Socially constructed body image of female adolescent cheerleaders. *Women in Sport and Physical Activity Journal, 20*(2), 22-34.

Stapleton, J., Turrisi, R., & Hillhouse, J. (2008). Peer crowd identification and indoor artificial UV tanning behavioral tendencies. *Journal of Health Psychology, 13*(7), 940-945. doi: 10.1177/1359105308095068.

Wysong, A., Gladstone, H., Kim, D., Lingala, B., Copeland, J., & Tang, J. Y. (2012). Sunscreen use in NCAA collegiate athletes: Identifying targets for intervention and barriers to use. *Preventive Medicine, 55,* 493-496. doi: 10.1016/j.ypmed.2012.08.020.

Yoo, J.J. (2009). Peer influence on adolescent boys' appearance management behaviors. *Adolescence, 44*(176), 1017-1031.

CHAPTER 3

"CHECK YOURSELF BEFORE YOU WRECK YOURSELF": A QUALITATIVE INVESTIGATION OF THE SKIN HEALTH AMONG MALE AND FEMALE LIFEGUARDS

Abstract

Lifeguards are exposed to large amounts of ultraviolet (UV) radiation thus increasing their risk of developing skin cancer over the course of their lifetimes. Lifeguards may report unique beliefs related to adopting healthy sun protective and early detection behaviors to enhance skin health. Therefore, a qualitative descriptive study was conducted to assess goals, barriers, and potential solutions to address skin cancer risk for lifeguards. The findings of this study suggest that lifeguards identified sun safety behaviors consistent with recommendations from reputable cancer organizations, and could identify specific barriers and solutions for overcoming these barriers. Finances, time, forgetfulness, peer influence, and discomfort were listed as barriers to recommended behaviors. Implications for cancer educators include recognizing and addressing the specific barriers to skin cancer prevention in aquatic environments and looking to the lifeguards as collaborators when designing educational programs.

Introduction

Approximately 3.5 million skin cancer cases are diagnosed in the United States every year (Rogers et al., 2010). Although only 5% of all new skin cancer cases, melanoma accounts for a majority of all skin cancer related deaths. The American Cancer Society estimates that 76,100 new cases of melanoma will be diagnosed this year and 9,710 people will die from the disease in the United States (American Cancer Society, 2014). Although melanoma is normally found in older adults, a study conducted in Olmstead County, Minnesota found increasing incidence of the disease among young adults ages 18 to 39 (Reed et al., 2012). Furthermore, melanoma affects individuals of all ages and is the leading cause of cancer-related death in women ages 25-35 (Devita, Lawrence, & Rosenberg, 2011).

The American Academy of Dermatology (2014) recommends five specific protective behaviors to reduce UV radiation exposure that leads to skin cancers including melanoma. These steps include seeking shade during peak hours, wearing protective clothing, applying broad spectrum sunscreen frequently and generously, using extra caution around water, sand and snow and avoiding intentional tanning (e.g., tanning beds). National studies by the Centers of Disease Control (CDC) found that about 45% of young adults ages 18-24 reported regular practice of a sun protective behavior (National Cancer Institute, 2012) and only 14.4% of teenage girls and 7.3% of teenage boys reported that they routinely used sunscreen to protect their skin (Eaton et al., 2012). A study among high school and college students (N=1,006) found that about 1 in 5 individuals had experienced a blistering sunburn within the past year (Cohen, Tsai, & Puffer, 2006). The American Cancer Society (2013) recommends physician

skin exams (PSE) as part of a regular cancer-related evaluation and argues that individuals should conduct regular skin self-exams. The rationale of screening is to find skin cancer at its earlier, more treatable stage. However, this stance is controversial as the U.S. Preventive Services Task Force (2009) does not currently recommend screenings (e.g., self-exam or clinician screening) for melanoma or non-melanoma skin cancer in the general public. Wolff, Tai and Miller (2009) admitted this stance on screening represented a lack of evidence related to the efficacy of routine screening in terms of benefit outweighing costs. Physician screening rates within the general public continue to rise, however, only 9.1% of 18-29 year olds reported ever being screened for skin cancer (Lakhani, Saraiya, Thompson, King & Guy, 2014).

Although there is a paucity of literature focusing on lifeguards' skin cancer risk, a study by Gies, Glanz, O'Riordan, Elliott and Nehl (2009) used dosimeter wristbands to measure the amount of UV exposure lifeguards (N=168) experienced while on the job. Dosimetry results showed that at least 74% of lifeguards experienced UV radiation exposure above recommended thresholds for occupational exposure. These findings also revealed an inadequacy of skin protection behaviors that likely contributed to over 50% of these lifeguards self-reporting sunburns at least twice each year.

Barriers for Youth and Lifeguards

Didlani and Orlow (2008) identified three main categories of barriers in the literature which include physical, psychological or attitudinal, and environmental barriers. Physical barriers include the cost of sunblock, shade structures and educational programs, inconvenience of sunscreen application and reapplication and the lack

of/conflicting apparel policies in schools regarding hats and sunglasses. Psychological and attitudinal barriers include peer pressure, appearance factors and media influence as well as poor modeling of behaviors from parents. Finally, environmental factors include a lack of sun protective environments such as shade structures where adolescents frequent to recreate, socialize and often work.

Tanning for appearance reasons was identified as a barrier by Merten, Higgins, Rowan and Pragle's study (2014) of adolescent beachgoers. Specifically, the researchers found 80% of respondents believed tanned skin looked healthy potentially serving as a motivation to expose skin to sun without protection. Additionally, only 63% of the respondents could identify peak hours of sun exposure and only 11% knew that sunscreen should be applied 30 minutes prior to sun exposure. Although most (72%) of the beachgoers in the study were wearing sunscreen at the time of the survey, only 14% had reapplied after 2 hours of use, putting them at increased risk for sunburns.

Adolescent and young adult lifeguards would likely experience many of the barriers identified by Didlani and Orlow (2008) and Merten et al. (2014) when planning to protect their skin from the sun; however, there may be specific barriers within the aquatic environment. Because of barriers experienced in a pool setting, lifeguards may have unique and creative means of overcoming those barriers that could be helpful to share in other lifeguard settings or other populations of youth who work or recreate outdoors. Therefore, this study's purpose was to investigate the barriers lifeguards face related to skin protection from UV radiation. By better understanding barriers that lifeguards face, we hope to prescribe solutions for helping lifeguards overcome those barriers.

Implementation Intention Interventions

Implementation intentions interventions provide an opportunity for individuals to identify intermediate steps in achieving a specific, intended goal (Gollwitzer, 1999). A goal could be stated as the following, "I intend to reach x!," allowing for the participant to address circumstances or barriers in the situation by stating "when situation x arises, I will perform response y." Gollwitzer states that this process increases automaticity of behaviors as they do not require conscious intention. By making the choice before the situation arises, the individual would be more likely to naturally follow the prechosen course of action. Implementation intention interventions have been used in skin cancer prevention research to create action plans for parents protecting their children from the sun Van Osch, Reubsaet, Lechner & de Vries, 2008) as well as to promote self-screening for other forms of cancer (Prestwich et al, 2005; Steadman & Quine, 2004).

Qualitative Description

Qualitative inquiry as a research methodology involves a variety of rigorous scientific approaches which may include phenomenology, ethnography, narrative, grounded theory and case study (Creswell, 2007; Marshall & Rossman, 2011). There has been a call for a more generic qualitative description to discourage researchers using less rigorous qualitative methods from claiming use of one of the principal approaches (Caelli, Ray, & Mill, 2003; Sandelowski, 2000). However, it is noted that although less rigorous than the distinctive qualitative approaches, generic or qualitative descriptive studies should still contribute to the knowledge base by engaging in

systematic data interpretation (Sandelowski, 2009). In a review of qualitative research regarding skin cancer perceptions, Garside, Pearson and Moxham concluded that educational campaigns can be enhanced by recognizing public perceptions and understanding of the disease and its risk factors (2010). Furthermore, their recommendations include addressing barriers through effective health education messaging.

Method

Participants

Twenty lifeguards employed at a public outdoor swimming facility located near Salt Lake City, Utah were recruited to participate in a sun safety presentation. This presentation was conducted by a community outreach program at the Huntsman Cancer Institute, a National Cancer Institute designated cancer center at the University of Utah. Eleven lifeguards consented to participate in the research yielding a 55% response rate. Lifeguards identified themselves as ages 17-20 years, and both male (45%) and female (55%) lifeguards participated. The lifeguards in the sample were hourly, seasonal employees of the swimming facility working fewer than 40 hours/week during the summer months.

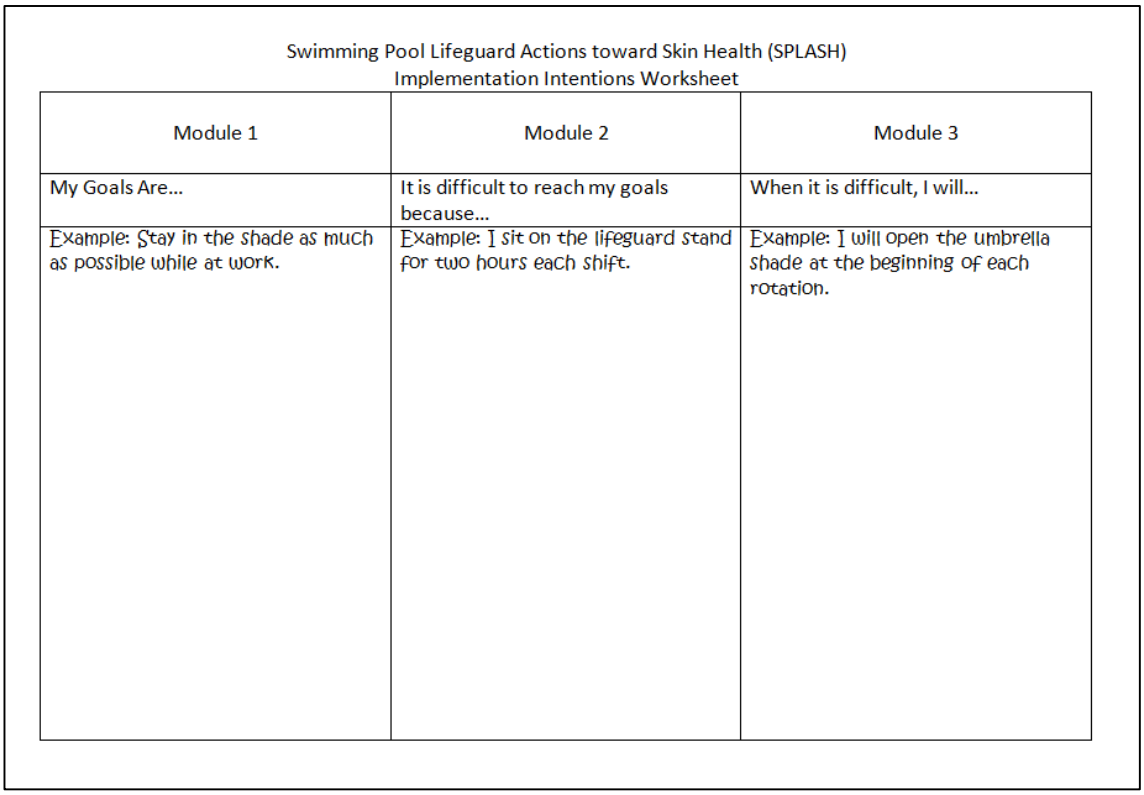
Procedures

This study received approval from the Institutional Review Board at the University of Utah and permission from the aquatic director of the pool. After obtaining consent or assent and parental permission, the researchers began to implement an

interactive workshop about maintaining healthy skin while working as a lifeguard. The presentation was activity-based and split into three 15-minute modules based on objectives for recognizing risks, barriers to protecting their skin, and developing efficacy for sun protective behaviors. An implementation intentions intervention worksheet (see Figure 2) was provided at the end of the first module and lifeguards were instructed to complete only that section. At the end of each module, participants were instructed to complete the corresponding section of the implementation intentions worksheet. If participants had difficulties with the activity, the instructor was trained to avoid providing specific examples aside from the example stated on the worksheet. After the first module, participants stated which skin health behaviors they intended to complete (Goals), after the second module lifeguards listed the barriers to that goal (Barriers) and after the third module, participants wrote down their own unique solution to address each barrier (Responses). Implementation intention worksheets were collected at the end of the presentation.

Measures

Data were collected from the worksheets structured by the implementation intention intervention (see Figure 2). The first column prompted the lifeguard with the statement, “My Goals Are…” and participants were given the example, “Stay in the shade as much as possible while at work.” The second column identified barriers to those goals with the prompt, “It is difficult to reach my goals because…” and stated an example, “I sit on the lifeguard stand for two hours each shift.” The third column required the lifeguard to find a solution to the barrier by prompting with the statement,



Swimming Pool Lifeguard Actions toward Skin Health (SPLASH)
Implementation Intentions Worksheet

Module 1	Module 2	Module 3
My Goals Are…	It is difficult to reach my goals because…	When it is difficult, I will…
Example: Stay in the shade as much as possible while at work.	Example: I sit on the lifeguard stand for two hours each shift.	Example: I will open the umbrella shade at the beginning of each rotation.

Figure 2: SPLASH Implementation Intentions Intervention Worksheet

"When it is difficult, I will…" and the example, "I will open the umbrella shade at the beginning of each rotation." For the purposes of this paper, these columns will be referred to as Goals, Barriers and Responses. Data were collected at the end of each 15-minute module.

Analysis

The analysis of these data included five steps. Step one was compilation and transcription where the data were compiled and transcribed verbatim into a single document for appropriate analysis. During this step, all data were double checked to ensure all personal identifiers were removed from the transcription. Step two involved a

reading of all of the data to familiarize the researcher with the language and structure of the responses. The third step was a categorizing step for each module where a coding structure was identified among the responses within the category. A fourth step of verifying the coding scheme was appropriate in the context across the categories to make a logical statement. A final step of comparing the data against the results took place to look for additional insights or patterns that were not seen in the initial analyses.

Results

From the 11 participants in the study, 44 total statements were recorded in the Goals category. In two cases, the statements were illegible and not included in the analysis. Of the 42 statements in the first column, 38 corresponding statements were made in the Barriers category and 33 solutions were stated in the Responses category, totaling 112 entries with 33 complete implementation intentions statements. An example for a complete statement that included a goal, barrier and solution was "Use sunscreen—I forget—Have another lifeguard help me remember."

Goals

The entries in this category were quite brief. For example, participants frequently would provide one-word answers such as "sunscreen" or "hat." In most cases, the entry stated a simple phrase such as "check self for skin cancer," "wear a hat," "wear more clothes," or "wear more sunscreen." Entries were coded by sun protective behaviors and screening behaviors that were referenced. Sun protective behaviors identified by the lifeguards included sunscreen use, which included proper

application of sunscreen, proper Sun Protective Factor (SPF) and appropriate reapplication. Other behaviors included wearing a hat, sunglasses, wearing additional clothing in general and shade seeking. Physician screening and self-screening behaviors were also identified by the lifeguards as early detection strategies. Notably, intentional tanning behaviors were the only American Academy of Dermatology (2014) recommendation not identified by the lifeguards, notwithstanding its inclusion in the lesson plan for the first module.

Barriers

The most common barriers identified by participants were related to the work environment of the lifeguard including long days outside in the sun. Among these, barriers specific to their worksite were mentioned including the required lifeguard uniforms that do not cover the shoulders and arms. The participants also noted the lack of holders for shade umbrellas on the lifeguard stands. The next most common barrier reported was a having a lack of financial resources, mostly to purchase sunscreen, but also for sunglasses and to pay for physician skin exams. Other attitudinal barriers included comfort issues (i.e., heat, sweating, itching), lack of time, forgetfulness, social pressures, having a lack of knowledge and appearance preference for tanned skin. Similarly, responses in this category were quite brief when referencing time or forgetting. However, some statements used more elaboration such as “It is too hot for too much clothing,” “Wearing sunscreen isn’t considered cool,” or “Have no money for sunglasses or a hat.”

Responses

Participants identified responses to the barriers in a number of common ways. The most common solutions indicated a need for self-motivation using statements such as “still put sunscreen on.” Other common solutions included incorporating behaviors into routines, accessing financial resources and making changes in their dress. Other solutions included setting reminders, changing the physical environment, gaining knowledge and seeking peer support. These entries were commonly single statements that often identified a specific action or behavior such as “work more hours” or “put on sunscreen each break.”

Implementation Intentions Statements

Screening behaviors. Barriers to physician screening behaviors were primarily related to a lack of financial resources. Lifeguards identified two means of getting financial resources which included putting in more hours at work and asking parents for money to see a dermatologist. Lifeguards typically did not list a barrier for skin self-exam behaviors simply stating, “Do it” in the Response category. However, one lifeguard mentioned that time was a factor and stated, “waking up early” as a solution. Another lifeguard felt that he or she did not know what to look for in a skin self-exam, but suggested that it would be easy to “find out what it looks like.” Another participant stated that it is important to “check yourself before you wreck yourself” which may have been a unique creation, or gleaned from another educational program.

Protective clothing, hats and sunglasses. Primary barriers to use of protective clothing that covers the shoulders, arms and legs included the heat of the day and work

environment. Lifeguards indicated that changing what they typically wear to work would overcome that barrier. One lifeguard mentioned that the required uniform was a barrier as the lifeguards in this facility are required to wear a tank top over their swimsuit that does not protect the arms and shoulders. Barriers to hat use included discomfort and pressure from peers to not wear a hat. In both cases, self-motivation strategies were stated as "it's safer to wear a hat so wear it" and "do it anyway." Sunglass use was listed as a goal by three of the lifeguards with two stating that finances were the barriers to use. Wearing eyeglasses was a barrier for one lifeguard who suggested that contact lenses would address that barrier. One lifeguard mentioned there is no time to put on extra clothing or a hat and indicated that it could be incorporated into his routine.

Shade seeking. A few of the lifeguards identified the pool as not having shade umbrellas on the top of the lifeguard stands. The lifeguards did not list a response for shade while on the stand, but stated they could find shade during their breaks. We did not collect data regarding sun safety policy or the availability of shade umbrellas on the lifeguard stands at this particular pool. It seemed from the lifeguard data that the overall on-duty environment of the lifeguard at this facility was in full exposure to the sun. Lifeguards expressed fairly extreme approaches to shade seeking (i.e., spending all breaks indoors) as shade is not available in the pool area.

Sunscreen use. Three main barriers emerged to the use of sunscreen at work. The first was that the guards reported they would forget to apply sunscreen before sun exposure at work. In attempts to remember to use sunscreen, the participants listed setting a reminder on their phones, self-motivating statements such as "put it on

anyway" and having another lifeguard help them to remember. Lifeguards also identified time as a factor for not applying sunscreen and listed responses such as "make it a habit" and "bring on the stand." Appearance factors were stated as barriers to sunscreen use such as "likes to tan." In all of the cases where appearance was mentioned, self-motivation statements were made such as "still put it on."

Discussion

Our findings indicate that there are common barriers to sun protective and screening behaviors among the participating lifeguards at this facility. These barriers seem consistent with Didlani and Orlow's (2008) findings that barriers fit into physical, attitudinal and environmental categories. Common goals toward skin health seem consistent with messages set forth in the educational program based on recommendations from the American Academy of Dermatology (2014) with the exception of the avoidance of indoor tanning practices. It is noteworthy that avoiding use of tanning beds was not listed as a goal despite the emphasis for it in the first module of the educational presentation. This may be due to our study's participants not using tanning beds.

Unsurprisingly, a lack of financial resources was reported as a common barrier across screening and sun protective behaviors. Financial barriers to sun safety goals seemed fairly simple to overcome by the guards in that they could find resources from family members or by working extra hours at work. The study participants perceived the financial barriers to be surmountable, but felt the need for support and education related to skin health. Financial barriers to clinical skin cancer screening were also

identified, but may be ameliorated by health care coverage offered by the pool or for lifeguards who remain on their parents' plan with the emergence of the Affordable Care Act. A reminder that a dermatologist visit is likely covered under a health plan or integrating a physician screening into the educational program could be a way to educate lifeguards.

A common response to a variety of barriers was a statement of self-motivation. This may indicate that lifeguards felt high self-efficacy of engaging in recommended behaviors to prevent skin cancer or to detect it early once financial or work related barriers are overcome. Work barriers seemed to be more daunting, particularly with regard to seeking the shade. Statements such as "stay in the break room as much as possible" or "every break umbrella for shade" may indicate the lifeguards had at least one harm reduction strategy of seeking shade at times where they felt a greater sense of control. This may have been preferred over petitioning their supervisors for shade structures be placed in the environment where they are on duty.

Peer influence, both as a barrier and as a response, was also a common theme in the data. Lifeguards reported that barriers to use of protective clothing and hats as well as sunscreen may be perceived as outside of the social norm. However, many turned to their peers as a source of support in terms of reminders when behaviors are difficult to remember to perform. Social factors relating to appearance also were evident in the data, with self-motivation strategies employed as a response. It seems interventions focusing not just on increasing skin cancer knowledge, but on appearance motives and culture change may be advantageous as so many of the lifeguards identified peer influences both as barriers and resources in attaining the goals they stated.

Implications of our findings for cancer educators include the need to recognize the unique attributes of adolescents in the context where they are exposed to UV radiation, recognizing the role of pool policies with regard to shade structures and uniforms and recognizing the creativity and resourceful nature of intelligent youth who look for opportunities to identify ways to protect their own health. It is also apparent that lifeguards could benefit from education regarding their risk and be provided with opportunities for free or low-cost dermatologist screenings. Partnering with a local dermatologist could be a powerful arrangement to increase exposures to group and individual education, motivating change in normative influences and reducing cost and time barriers to physician screening as well as knowledge barriers for self-screenings. A nurse or health educator could also be present to discuss better skin protection goals, ways to identify, reduce or eliminate barriers and provide resources for the lifeguard and pool management to improve the sun safety environment for pool staff and patrons.

This study advanced health education research about skin health; however, the project had several limitations. First, the participants offered minimal feedback relative to open-ended questions. Specifically, each participant offered only several statements that were useful for the analysis. The second limitation was that the data were generated by participants at a single swimming pool. Sampling multiple pools may have provided a richer representation of goals, barriers and strategies for lifeguards relative to skin health. Finally, we hope to collect more robust data in the future with a larger sample size to increase potential for generalizability.

Future research could include a more rigorous consideration of the central question, perhaps as a case study approach of the barriers faced by lifeguards at a single

swimming facility. A grounded theory approach with a significant sample of lifeguards' goals, barriers and responses across several facilities may also be informative about psychosocial barriers in this population. Moreover, research into educational programs using implementation intention interventions may provide a greater insight into the lifeguard's perceptions of self and response efficacy, barriers and risks associated with their occupation. Future work may also consider a community based participatory research paradigm for accessing and incorporating the aquatic community into their work and helping develop solutions to overcoming barriers to primary and secondary prevention of skin cancers.

References

American Academy of Dermatology. (2014). *How Do I Prevent Skin Cancer?* Retrieved from http://www.aad.org/spot-skin-cancer/understanding-skin-cancer/how-do-i-prevent-skin-cancer.

American Cancer Society. (2013). *Can Melanoma Be Found Early?* Retrieved from http://www.cancer.org/cancer/skincancer-melanoma/detailedguide/melanoma-skin-cancer-detection.

American Cancer Society. (2014) *Cancer Facts and Figures 2014*. Retrieved from http://www.cancer.org/acs/groups/content/@research/documents/document/acspc-041770.pdf.

Caelli, K., Ray, L., & Mill, J. (2003). 'Clear as Mud': Toward greater clarity in generic qualitative research. *International Journal of Qualitative Methods, 2*(2), 1-13.

Cohen, P. H., Tsai, H., & Puffer, J. C. (2006). Sun-protective behavior among high-school and collegiate athletes in Los Angeles, CA. *Clinical Journal of Sport Medicine, 16*(3), 253-260.

Creswell, J. W. (2007). *Qualitative Inquiry & Research Design, 2nd Ed.* Thousand Oaks, CA. Sage.

Dadlani, C., & Orlow, S.J. (2008). Planning for a brighter future: A review of sun protection and barriers to behavioral change in children and adolescents. *Dermatology Online Journal, 14*(9). Retrieved from: http://escholarship.org/uc/item/6vs1r0r9.

Devita, V. T. Lawrence, T. S., & Rosenberg, S. A. (2011) *Cancer: Principles & practice of oncology, 9th Ed.* Philadelphia, PA: Lippencott Williams & Wilkins.

Eaton, D.K., Kann, L., Kinchen, S., Shanklin, S., Flint, K.H., Hawkins, J.,…Wechsler, H. (2012). Youth risk behavior surveillance—United States, 2011. *MMWR Surveillance Summaries, 61*(4), 1–162.

Garside, R., Pearson, M., & Moxham, T. (2010). What influences the uptake of information to prevent skin cancer? A systematic review and synthesis of qualitative research. *Health Education Research, 25*(1), 162-182. doi: 10.1093/her/cyp060.

Gies, P., Glanz, K., O'Riordan, D., Elliott, T., & Nehl, E. (2009). Measured occupational solar UVR exposures of lifeguards in pool settings. *American Journal of Industrial Medicine, 52*, 645-653. doi:10.1002/ajim.20722.

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist, 54*, 493-503.

Lakhani, N.A., Saraiya, M., Thompson, T.D., King, S.C., & Guy, G.P. (2014). Total body skin examination for skin cancer screening among U.S. adults from 2000 to 2010. *Preventive Medicine 61*, 75-80. doi: 10.1016/j.ypmed.2014.01.003

Marshall, C. & Rossman, G.B. (2011). *Designing qualitative research, 5th Ed.* Thousand Oaks, CA. Sage.

Merten, J.W., Higgins, S., Rowan, A., & Pragle, A. (2014). Sun safety knowledge, attitudes and behaviors among beachgoing adolescents. *American Journal of Health Education, 45*, 37-41. doi: 10.1080/19325037.2013.852997

National Cancer Institute. (2012) *Cancer Trends Progress Report—2009/2010 Update: Sun Protection.* Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services. http://progressreport.cancer.gov.

Prestwich, A., Conner, M., Lawton, R., Bailey, W., Litman, J., & Molyneaux, V. (2005). Individual and collaborative implementation intentions and the promotion of breast self-examination. *Psychology and Health, 20*(6), 743-760.

Reed, K.B., Brewer, J. D., Lohse, C. M., Bringe, K. E., Pruitt, C. N., & Gibson, L. E. (2012). Increasing incidence of melanoma among young adults: An

epidemiological study in Olmstead County, Minnesota. *Mayo Clinic Proceedings, 87*(4), 328-334. doi:10.1016/j.mayocp.2012.01.010.

Rogers, H. W., Weinstock, M.A., Harris, A.R., Hinckley, M.R., Feldman, S.R., Fleischer, A.B., & Coldiron, B.M. (2010) Incidence estimate of nonmelanoma skin cancer in the United States, 2006. *Archives of Dermatology, 146*(3), 283-287. doi: 10.1001/archdermatol.2010.19.

Sandelowski, M. (2000). Whatever happened to qualitative description? *Research in Nursing & Health, 23,* 334-340.

Sandelowski, M. (2009). What's in a name? Qualitative description revisited. *Research in Nursing & Health, 33*(1), 77-84. doi: 10.1002/nur.20362.

Steadman, L., & Quine, L. (2004). Encouraging young males to perform testicular self-examination: A simple, but effective, implementation intentions intervention. *British Journal of Health Psychology, 9*(4), 479-487.

U.S. Preventive Services Task Force (2009). *Screening for Skin Cancer.* Retrieved from http://www.uspreventiveservicestaskforce.org/uspstf/uspsskca.htm.

Van Osch, L., Reubsaet, A., Lechner, L., & de Vries, H. (2008). The formation of specific action plans can enhance sun protection behavior in motivated parents. *Preventive Medicine, 47*, 127-132. doi: 10.1016/j.ypmed.2009.02.025.

Wolff T., Tai E., Miller T. (2009) *Screening for Skin Cancer: An Update of the Evidence for the U.S. Preventive Services Task Force.* Rockville, MD, Agency for Healthcare Research and Quality (US) Feb. Available from: http://www.ncbi.nlm.nih.gov/books/NBK34051/.

CHAPTER 4

APPEARANCE AS A MOTIVATOR FOR SUN PROTECTION AMONG ADOLESCENT AND YOUNG ADULT LIFEGUARDS

Abstract

Lifeguards are exposed to high levels of UV radiation over a large percentage of the surface area of their bodies. Appearance appeals have been effective for improving sun protective behaviors in other populations. This study evaluates the potential of appearance motives as a target for skin cancer prevention education among adolescent and young adult lifeguards. A cross-sectional questionnaire-based design was used to evaluate the relationships of appearance and health motivators and sun protective behaviors among lifeguards employed at public swimming facilities. Appearance was strongly associated with sun protective behavioral intentions and self-reported behaviors. Our study found that appearance threat messaging can be a powerful tool for educational interventions. Targeting appearance-based motives may be an effective strategy for reducing sun exposure among adolescent and young adult lifeguards.

Background

Skin cancer is the leading type of cancer with approximately 3.5 million skin cancer cases diagnosed in the United States every year [1]. Melanoma, a deadly form of

skin cancer, accounts for a majority of all skin cancer related deaths but only accounts for 5% of all new skin cancer cases. The American Cancer Society estimates that in the United States, 76,100 new cases of melanoma will be diagnosed this year and 9,710 people will die from the disease [2]. Melanoma affects individuals of all ages and is the leading cause of cancer-related death in women ages 25-35 [3] and there is evidence that the disease is affecting younger people with greater frequency. For example, a study conducted in Olmstead County, Minnesota found increasing incidence of the disease among young adults ages 18 to 39 [4].

The American Academy of Dermatology [5] recommends five specific behaviors that reduce UV radiation exposure leading to skin cancers including melanoma. These steps include avoiding intentional tanning (e.g., tanning beds), seeking shade during peak hours, wearing protective clothing, applying broad spectrum sunscreen generously and frequently, and using extra caution around water, sand and snow. However, national studies by the Centers of Disease Control (CDC) found that only 45% of young adults ages 18-24 reported regular practice of one or more sun protective behaviors [6] and only 14.4% of teenage girls and 7.3% of teenage boys reported that they routinely used sunscreen to protect their skin [7]. A study among college and high school students in Los Angeles (N=1,006) found that about 1 in 5 individuals had experienced a blistering sunburn within the past year [8].

Although the literature surrounding lifeguards and skin cancer risk is fairly limited, a study by Gies, Glanz, O'Riordan, Elliott and Nehl [9] used dosimeter wristbands to assess the amount of UV exposure lifeguards (N=168) experienced within the occupation. Dosimetry results showed that 74% of lifeguards experienced UV

radiation exposure above the recommended thresholds for occupational exposure. These findings also revealed an inadequacy of skin protection behaviors that likely contributed to over 50% of these lifeguards self-reporting sunburns at least twice each year.

Body Image and Skin Cancer Risk

Tanning for appearance reasons was identified as a motivation to put skin at risk by Merten, Higgins, Rowan and Pragle's study [10] of adolescent beachgoers. The researchers found 80% of respondents perceived tanned skin as looking healthy, potentially serving as a motivation to expose skin to sun without protection. Although most (72%) of the beachgoers in the study were wearing sunscreen at the time of the survey, only 14% had reapplied after 2 hours of use, putting them at increased risk for sunburns. The research also revealed that only 63% of the respondents could identify peak hours of sun exposure and only 11% knew that sunscreen should be applied 30 minutes prior to spending time in the sun.

In Argentina, research among adolescent athletes (N=554) conducted by Lafargue, Merediz, Bujan and Pierini [11] found significant gender differences in the associations between health, beauty and tanned appearance. Female beachgoers were more likely to associate tanned skin with beauty while males were more likely to associate tanned skin with health. This could be related to results of content analyses of advertising in magazines and other media over the past decade [12, 13]. Team and Markovic [12] found that online advertisements from tanning salons mostly targeted women in Australia. These same advertisements only featured limited information on health risks while displaying messages about tanning as relaxing and safe. Cho and

colleagues [13] found that 40% of magazine articles touted tanning as a means of looking healthy. They also determined that messages about health and appearance benefits far outweighed information about consequences of tanning practices, particularly in magazines directed toward younger girls.

Dixon, Dobbinson, Wakefield, Jamsen and McLeod [14] compared the content of spring and summer issues of popular magazines with survey data of a sample of women (*N*=4,422). This study found a significant relationship between exposure to messages and perceptions about the health and appearance effects of tanning practices. Among younger women, the results showed a significant relationship between exposure and the perception of peer norms that support tanned skin for health and appearance purposes. SooHoo, Reel and Pearce [15] considered body comparison with peers among teenage cheerleaders by citing an example of one respondent comparing herself with her peers with regard to the evenness and depth of their tans. Although tanned skin does not emerge as a major theme in their study, the comparison to others in the peer group was a key factor in the construction of one's perception of appearance norms.

Men are not immune to the perceived effects of tanning on appearance. A study by Banerjee, Campo and Greene [16] showed images of models in front of a group of college aged men (*N*=135) and women (*N*=226) and had subjects report their sense of the model's health attractiveness, thinness and height. Men were more likely to perceive the darkly tanned models as more physically attractive and healthier than the lightly tanned and moderately tanned models in the images. In a study with adolescent boys (*N*=155), Yoo [17] found that appearance motives predicted tanning bed use, piercing and tattooing regardless of their understanding of potential permanent effects and health

risks of these behaviors. Reilly and Rudd [18] found that appearance motives also predicted tanning behaviors among gay men (*N*=103).

In both young men and women, Reynolds [19] found that there was an overwhelming sense among adolescents to disregard long-term health risks to attain the appearance effects associated with indoor and outdoor practices. The author observed that most of the efforts toward preventing tanning bed use were geared around increasing knowledge about the practice rather than focusing on the costs, rewards and appearance motives associated with the behaviors.

Appearance-Based Interventions

Recently, appearance-based interventions have been used among tanning bed users and sun seekers as a means of motivating participants to reduce UV exposure [20]. Abar, Turrisi, Hillhouse, Loken, Stapleton and Gunn [21] implemented a workbook intervention designed to influence appearance through alternatives to indoor tanning among female college students (*N*=1,690). They found that participants who engaged in moderate and heavy tanning prior to the program decreased their frequency of tanning bed use when exposed to a short workbook-based intervention compared to a control group. Their findings suggest that even short interventions can produce significant effects in prevention behaviors that are both time and cost effective. Similarly, Hillhouse, Turrisi, Stapleton and Robinson [22] reported reductions in tanning intentions among female tanning bed users (*N*=430) across months where generally intentions and behaviors increase while developing the workbook used in the previous study.

In addition to reducing tanning behaviors, Mahler, Kulik, Gibbons, Gerrard and Harrell [23] used UV photography techniques in two separate experiments designed to increase sun protective behaviors. UV photography uses a special filter on a camera that exposes underlying pigmentation changes on the skin allowing a viewer to see the damage the sun has caused. In this research, they found an increase in sun protection and a reduction in sun seeking among those exposed to UV photography. The first experiment among both male and female undergraduates in California (*N*=68) randomized participants into a group that had UV facial photographs or into a control group. The results showed stronger intentions to use sunscreen in the future and reduced perceived rewards in the photo group. The second experiment combined education with the photo intervention among southern California residents (*N*=76). Among those participants, posttest data revealed stronger intentions toward future sunscreen use compared with those who did not receive the photo treatment. The authors also emphasize the ease and cost-effectiveness of the intervention.

Extended Parallel Process Model

The Extended Parallel Process Model (EPPM) was developed by Witte [24] by combining theoretical constructs and relationships from three previous models of fear research including Rogers' [25] Protection Motivation Theory (PMT), fear-as-acquired drive model [26], and Leventhal's [27] parallel process model. Witte [24] merged these theories to match the empirical data to postulate the EPPM to explain the influence a fear appeal in a health message may have on whether that message is accepted or avoided.

The model states that two outcomes are generally seen as a result of exposure to a fear-based message: message acceptance or message avoidance. These outcomes are generally determined at the control process followed based on the fear and efficacy conditions that the individual is exposed to. In the circumstance where a fear appeal is present and the recipient of that message perceives high efficacy to manage it, a danger control process is employed leading to message acceptance. On the other hand, when a low perception of efficacy is present, a process is employed to simply manage the fear. Strategies such as denial or fatalism are used to manage the emotion and avoid the message.

EPPM in skin cancer prevention. The EPPM has driven many skin cancer prevention programs. Stephenson and Witte [28] used the EPPM to study how fear and efficacy appeals can be used in messaging to prevent skin cancer among college students. Rimal and Real [29] used the EPPM in two skin cancer experiments to derive a Risk Perception Attitude (RPA) framework intending to classify individuals into groups where tailored messages can be delivered. Also among college students, Cho and Salmon [30] studied fear appeals across stages of behavior change among college students. Millar and Houska [31] used the model to examine how masculinity and fear interact with skin cancer prevention messages among male college students. In a study of male and female college students (N=172), participants were grouped into high and low masculine groups. They found that high masculine groups were more responsive at reporting intentions toward sun protection and self-screening behaviors when exposed to a fear reducing message.

Purpose

The purpose of our study was to determine which key motivators may predict skin protection intentions and behaviors among adolescent and young adult outdoor lifeguards in recreational pool settings. We compared both perceived threat of appearance and health to identify which messages might be most effective in motivating sun protective actions. By determining if motivators influence intentions and behaviors, health educators may be able to create more effective interventions that promote healthy skin behaviors to reduce skin cancer risk.

Methods

Participants

Cross sectional data were collected from lifeguards employed at seven outdoor swimming pools in two counties in Utah in June, 2013 and March, 2014. Of the 320 invited to participate, 126 completed the survey. Of the 126 participants, 13 individuals were found to be ineligible due to age or incomplete documentation of informed consent, assent or parental permission. The data were collected at the facility where the lifeguard was employed. Participants had to be employed and trained lifeguards at the swimming facility with no personal history of skin cancer.

Procedures

After approval from the University of Utah Institutional Review Board, pool managers were contacted by telephone and e-mail by the research team. Adult participants completed an informed consent form while minors completed an assent

form and their parents completed a parental permission form. Members of the research team visited each pool to meet with the pool manager and provided copies of the questionnaire. One week later, members of the team returned to the pool to collect the questionnaires. For the groups tested in June 2013, the questionnaire was a pretest measure to gather baseline information to evaluate the effectiveness of a sun safety educational program for outdoor lifeguards.

Measures

Participants completed a questionnaire seeking information about demographic information, sun protective intentions and behaviors, and motivators based on constructs from the health belief model and extended parallel process model. Demographic information included age, sex, personal and family history of skin cancer, skin type and desired skin type. Skin type was measured using the Fitzpatrick [32] scale. Sun protective behaviors and intentions were derived from scales from Azzarello, Dessureault and Jacobsen [33]. Motivators, including perceived susceptibility of photoaging, perceived susceptibility of skin cancer, perceived severity of photoaging, perceived susceptibility of skin cancer, costs of sun protection, rewards of sun exposure and self-efficacy of sun protective behaviors were used from Mahler, Kulik, Gibbons, Gerrard and Harrell [23]. The final questionnaire consisted of 90 total items with six of those items conditional upon the responses to other items.

Analysis

Data were analyzed using SPSS 20.0 statistical software. Frequencies, correlations and hierarchical linear regressions were used to identify associations and predictors of key variables in the data. Statistical significance was set at α level equal to 0.05.

To determine the study's sample size, an *a priori* power analysis using G*Power 3.1 [34] for R square change on a blocked multiple regression with 3 predictors tested of 9 total predictors of the model resulted in a recommended sample size of at least 77 to detect an effect size f^2 =.15, with error parameters of α=.05 and 1-β=.80

Results

Population Characteristics

One hundred twelve lifeguards completed the survey. The age range of the participants was 16 to 26 with an average age of 19 (*SD*=2.23). Both sexes were represented with 34.8% identifying as male and 65.2% identifying as female. All were trained and employed as lifeguards and none had been diagnosed with any form of skin cancer. Of these, 10.7% reported having a first-degree relative diagnosed with skin cancer. The most common skin type reported was "fair" (54.5%) and most participants reported that they wish that their natural skin tone was darker (58.9%) or did not wish their skin was a different natural tone (37.5%). All demographic frequencies are displayed in Table 1.

Table 1.
Demographic Characteristics of Lifeguards Participating in the Study (N=112)

	Frequency	Percentage
Age		
16-17	26	23.2
18-19	46	41.1
20-21	25	22.3
22-23	7	6.3
24-26	6	5.4
Sex		
Male	39	34.8
Female	73	65.2
Skin After Two Hours in the Sun		
Burns, never tans	5	4.5
Burns easily, then develops a light tan	14	12.5
Burns moderately, then develops light tan	33	29.5
Burns minimally, then develops moderate tan	42	37.5
Doesn't burn, develops dark tan	17	15.2
Doesn't burn, skin is naturally dark	1	0.9
Natural Skin Color		
Very fair	7	6.3
Fair	61	54.5
Olive	34	30.4
Light Brown	10	8.9
Family History of Skin Cancer		
Yes	12	10.7
No	98	87.5
How Would You Change Your Natural Skin Color?		
Wouldn't change	42	37.5
Naturally lighter	1	.9
Naturally darker	66	58.9

Sun Protection Intentions and Behaviors

Intentions. Sun protection intentions were measured on a 1-5 scale with the most sun protective intentions described by the highest number. Lifeguards' averages were strongest for intentions to wear sunglasses (*M*=4.45) and avoid tanning beds (*M*=4.37) and were weakest for wearing clothing (*M*=2.83) and shade seeking (*M*=2.97). The overall scale average for intentions was 3.68 (*SD* =.62) with a Cronbach's α of .63.

Sun protective behaviors. Sun protective behaviors were measured on a 1-7 scale describing how often the participant engaged in that behavior during the previous month with 1 being never and 7 being always. Lifeguards reported an average use of sunglasses (5.55), sunscreen on the face (5.04), sunscreen on the body (4.30), using protective clothing (3.33) and shade seeking (3.37). The overall scale average for sun protective behaviors was 4.31 (sd =1.18) with a Cronbach's α of .75.

Average scores for both individual intention and sun protective behavior items are displayed in Table 2.

Motivators

Scales for motivators of sun protection were created from the questionnaire based on findings from Mahler, Kulik, Gibbons, Gerrard and Harrell. These motivators included perceived susceptibility of photoaging, perceived susceptibility of skin cancer, perceived severity of photoaging, perceived susceptibility of skin cancer, costs of skin protection, and rewards of sun exposure. All items were scored by participants on a Likert-type scale of 1-5 where items 1=strongly disagree and 5=strongly agree. A self-

Table 2.
Averages of Self-Reported Sun Protective Behaviors and Intentions.

Behaviors (1-7 scale)	Mean (SD)	Intentions (1-6 scale)	Mean (SD)
Wear Sunscreen on Face	5.04(1.80)	Wear Sunscreen on Face	3.95 (1.01)
Wear Sunscreen on Body	4.30(1.82)	Wear Sunscreen on Body	3.55 (1.07)
Wear Protective Clothing	3.33(1.68)	Wear Protective Clothing	2.83 (1.04)
Seek the Shade	3.37 (1.36)	Seek the Shade	2.97 (1.00)
Wear Sunglasses	5.55 (1.63)	Wear Sunglasses	4.45 (0.79)
		Avoid Tanning Beds	4.37 (1.22)

efficacy scale was also created but scored on a scale of 1-10, with 10 being the most confident the participant could perform the behavior.

Perceived susceptibility of photoaging. This scale was created from 8 items from the questionnaire. A sample question is "I am too young to spend much time thinking that I might get wrinkles and age spots." The average score from this scale was 3.61 (*SD* = .54) and reliability testing demonstrated a Cronbach's α score of .76.
for this scale is "The possibility of getting skin cancer worries me." The average score from this scale was 3.72 (*SD* = .54) and the reliablility score was a Cronbach's α of .73.

Perceived severity of photoaging. Perceived severity of photoaging was measured using 6 items from the questionnaire. A sample question is "It would be terrible to have wrinkles on my face." The average score from this scale was 3.54 (*SD* = .70) and Cronbach's α = .83.

Perceived severity of skin cancer. A severity scale for skin cancer was created

from 6 items in the questionnaire as well. A sample item for this scale is "It would be terrible to have skin cancer of any kind." The average score on this scale was 4.09 (*SD* = .51) and the Cronbach's α was the weakest of the scales at .61.

Costs of skin protection. Costs were measured using 12 items. A sample item from this scale is "I would not wear a wide-brimmed hat while at the beach or in the sun because it would be too hot." The average score for this scale is 2.94 (*SD* = .58) and its reliability measured at α=.80.

Rewards of sun exposure. A rewards scale was also created from 10 items from the questionnaire. A sample item for this scale is "I think I look healthier when I have a tan." For this scale, the average score was 3.06 (*SD* = .60) and the reliability test showed a Cronbach's α of .85.

Self-efficacy. A separate self-efficacy measure was included from 12 additional items scored from 1-10. A sample item from this scale is "I could make using sunscreen a part of my daily routine, like brushing my teeth." The average score on this scale was 6.99 (*SD* = 1.86) and its reliability tests at α=.96.

Relationships Between Variables

A Pearson correlation matrix was created to evaluate significant relationships between variables. Results from the correlation analysis are provided in Table 3.

Personal characteristics and appearance/health motives. Sex was significantly associated with perceived threat for both aging and cancer. Females had higher perceived susceptibility to aging ($r = .44$, $p < .01$), perceived susceptibility to cancer (*r*

Table 3

Bivariate Correlation Matrix of Demographics, Predictors, Intentions and Behaviors of Sun Safety.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1. Age		-.17	.04	-.01	-.15	.08	.16	-.08	.07	-.21*	-.17	.16	-.10	-.20*
2. Sex			.00	-.09	-.00	.44**	.26**	.18	-.01	.06	.13	.16	.03	.13
3. Skin After Two Hours				.58**	.00	-.04	-.18	-.14	-.09	.21*	.17	-.17	-.21*	-.15
4. Natural Skin Color					.12	-.07	-.19*	-.14	-.01	.08	.24*	-.09	-.20*	-.17
5. Family History						-.10	-.14	.01	.08	.02	-.12	-.13	-.13	-.12
6. Susceptibility Aging							.63**	.52**	.25**	-.14	-.10	.28**	.30**	.23*
7. Susceptibility Cancer								.25**	.45**	-.13	-.24*	.31**	.22*.	.07
8. Severity Aging									.24*	-.05	-.02	.04	.23*	.27**
9. Severity Cancer										-.15	-.17	.22*	.15	.07
10. Costs											.61**	-.42**	-.34**	-.33**
11. Rewards												-.25**	-.31**	-.26**
12. Self Efficacy													.42**	.27**
13. Intentions														.70**
14. Behaviors														

*$p < .05$, **$p < .01$

= .26, $p < .01$). Natural skin color was negatively associated with perceived susceptibility of skin cancer ($r = -.19$, $p < .05$). There were no significant associations with age, skin sensitivity and family history of skin cancer and perceived threat of aging or cancer.

Personal characteristics and costs/rewards. Age was negatively associated with costs of skin protection ($r = -.21$, $p < .05$) Sensitivity to sunburn is associated with costs of skin protection as well ($r = .21$, $p < .05$) with the sensitivity scale increasing with less likelihood of sunburn. Natural skin tone is associated with rewards of sun exposure ($r = .24$, $p < .01$) with the darker the natural skin tone, the higher the reward.

Personal characteristics and efficacy, intentions and behaviors. There was a significant association between age and sun protective behaviors ($r = -.20$, $p < .05$) suggesting that younger participants reported protecting their skin more frequently. Intentions were negatively associated with skin sensitivity ($r = -.21$, $p < .05$) and natural skin tone ($r = -.20$, $p < .05$). Efficacy was not significantly correlated with any personal factors and sex and family history were not associated with efficacy, intentions or behaviors.

Appearance/health motives and intentions and behaviors. Appearance motives and health motives differ in their association with sun protective intentions and behaviors. Perceived susceptibility of aging is positively associated both with intentions ($r = .30$, $p < .01$) and behaviors ($r = .23$, $p < .05$) while perceived severity of cancer is only positively associated with intentions ($r = .22$, $p < .05$). Perceived severity of aging is significantly associated with both intentions ($r = .23$, $p < .05$) and behaviors ($r = .27$, $p < .01$) but perceived severity of cancer has no significant association with either

outcome variable.

Costs/rewards and intentions and behaviors. Negative relationships between costs and rewards and outcome variables were evident in the data. Significant associations were found between costs and intentions (r = -.34, p < .01) and behaviors (r = -.33, p < .01). Similarly, associations between rewards and intentions (r = -.31, p < .01) and behaviors (r = -.26, p < .01) demonstrate the inverse relationship barriers have with outcomes.

Self-efficacy. Self-efficacy was positively associated with perceived susceptibility of aging (r = .28, p < .01), perceived susceptibility of skin cancer (r = .31, p < .05) and perceived severity of skin cancer (r = .22, p < .05). Negative associations were also found with self-efficacy and costs (r = -.42, p < .01) and rewards (r = -.25, p < .01).

Associations of Motivators to Sun Protective Intentions and Behaviors

To assess the association of the motivators to sun protection, blocked hierarchical regression analysis was carried out with intentions and behaviors as outcome variables, personal characteristics (age, gender, skin after 2 hours of sun exposure, natural skin appearance and family history of skin cancer) in block 1 and motivators in blocks 2 and 3. Results of all blocked regressions are provided in Table 4. For sun protective behaviors, the analysis is significant at block 1, r = .33, R^2 = .11, F change (5, 101) = 2.49, p < .05, with age loading a significant result (b= .12, SE =.05, t =-2.38, p<.05). No other variables entered in block 1 for sun protective behaviors were significant. Neither block 1 with intentions as an outcome nor any of the variables

Table 4. *Hierarchal Regression of Sun Protective Intentions and Behaviors (N=102.)*

		Intentions			Behaviors		
		b (*SE*)	*t*	$R^2\Delta$	*b* (*SE*)	*t*	$R^2\Delta$
Block 1:	Age	-.03 (.03)	-1.15	.07	-.12 (.05)*	-2.38	.11*
	Gender	.05 (.13)	.35		.22 (.24)	.93	
	Skin After Two Hours	-.08 (.07)	-1.09		-.11 (.13)	-.83	
	Natural Skin Tone	-.07 (.10)	-.72		-.12 (.18)	-.65	
	Family History	-.25 (.19)	-1.32		-.53 (.36)	-1.51	
Block 2a:	Susceptibility of Cancer	.24 (.15)	1.65	.04	.28 (.28)	-1.01	.07
	Severity of Cancer	.03 (.14)	.21		.38 (.27)	1.42	
Block 2b:	Susceptibility of Aging	.42 (.13)	3.18	.12**	.24 (.25)	.95	.05†
	Severity of Aging	.03 (.10)	.26		.27 (.18)	1.47	
Block 2c:	Costs of Sun Protection	-.15 (.13)	-1.15	.21**	-.56 (.24)*	-2.35	.16**
	Rewards of Sun Exposure	-.16 (.12)	-1.34		-.18 (.23)	-.78	
	Self-Efficacy	.11 (.03)**	3.34		.08 (.06)	1.41	
Block 3a1:	Susceptibility of Aging	.41 (.16)*	-.12	.08**	.51 (.30)	1.71	.06*
	Severity of Aging	.03 (.10)	.64		.19 (.19)	1.00	

Notes. Hierarchical regression analysis with $R^2\Delta$ reported for each block. Block 3a1 was a third block on Block 2a to report $R^2\Delta$ for appearance factors.
†p = .05 *p < .05 **p <.01

entered therein showed a significant result.

Health and appearance perceptions on intentions and behaviors. To test the effect health and appearance motivators have on intentions and behaviors, blocked hierarchical regression analyses were performed with demographic factors entered in block 1, and perceived threat variables for cancer and appearance entered into block 2. Perceived susceptibility to cancer and perceived severity of cancer were entered in block 2 for the first analysis (denoted block 2a), and perceived susceptibility to aging, perceived severity of aging in the second analysis (denoted block 2b).

The first analysis did not show a significant R^2 change for either intentions or behaviors with perceived threat of cancer variables entered into block 2. However, both intentions and behaviors for perceived threat of appearance variables demonstrated significant R^2 change. For intentions, block 2b was significant, $r = .44$, $R^2 = .19$, F change $(2, 99) = 7.57$, $p < .01$, and for behaviors, block 2b loaded a significant result, $r = .40$, $R^2 = .16$, F change $(2, 99) = 3.08$, $p = .05$. Overall, individual variables did not show a significant result, with the exception of susceptibility to premature aging on intentions ($b = .42$, $SE = .13$, $t = 3.18$, $p < .05$).

Costs, rewards and self-efficacy. To test the effects of costs, rewards and self-efficacy motivators on sun protection intentions and behaviors, blocked hierarchical regression analyses were performed with the same demographic factors of age, sex, skin after 2 hours in the sun, natural skin appearance and family history of skin cancer in block 1 and costs, rewards and self-efficacy in block 2 (denoted 2c).

The analyses showed a significant R^2 change for both intentions, $r = .53$, $R^2 = .28$, F change $(3, 96) = 9.57$, $p < .01$, and behaviors, $r = .54$, $R^2 = .29$, F change $(3, 96)$

= 7.18, $p < .01$ in block 2. For specific variables, self-efficacy was significantly associated with intentions (b= .11, SE =.03, t =3.34, p<.01) and costs of sun protection were significantly associated with self-reported sun protective behaviors (b= -.56, SE =.24, t =-2.35, p<.05).

Appearance perceptions beyond health perceptions. To test the influence of appearance perceptions over health perceptions, blocked hierarchical regression analyses were performed with demographic factors in block 1, health perceptions in block 2 (denoted block 2a) and appearance perceptions in block 3 (denoted block 3a1).

The analyses showed a significant R^2 change for both intentions, r = .440, R^2 = .19, F change (2, 97) = 4.93, $p < .01$, and behaviors, r = .44, R^2 = .19, F change (2, 97) = 3.80, $p < .05$ for block 3 above the effects of blocks 1 and 2. The only specific variable that had a significant effect in block 3 was susceptibility of aging for intentions (b= .41, SE =.16, t =2.57, p<.05).

Discussion

Our findings suggest that perceived threat to one's appearance is a stronger motivator than perceived threat to one's health among this sample of lifeguards. The majority of lifeguards statement that they would prefer a darker natural skin tone if given the opportunity demonstrates a general dissatisfaction for one's skin appearance. Similarly, significant correlations between EPPM constructs relating to perceived threat of appearance and sun protective behaviors suggest associations between that perception and the willingness to protect oneself from that threat. Finally, the perceived appearance threat as a predictor of sun protective behaviors and intentions itself and

above and beyond the perceived threat of skin cancer fortify the assertion that appearance may mean more to adolescent and young adult lifeguards than cancer risk.

These results add to the growing body of research suggesting a role for appearance based interventions for skin cancer prevention in the cancer control community. By appealing to the motivation to protect appearance among young lifeguards, prevention programs may be effective at improving the intentions to protect one's skin and the behaviors associated with reduced risk of skin cancer. This research may also shed more light as to why such interventions are effective compared to traditional approaches that focus on the cancer threat among adolescents and young adults.

Our findings also suggest that perceptions of costs of adopting sun protective behaviors and the rewards of sun exposure and self-efficacy are also associated with sun protective intentions and behaviors among adolescent and young adult lifeguards. There are also moderate relationships between the variables themselves suggesting an opportunity to improve self-efficacy by reducing perceptions of costs and rewards through educational, environmental or cultural interventions among this population.

Limitations

This study is limited primarily by the use of self-report to examine sun protective behaviors, intentions and the motivators discussed in this article. Although the scales used in the research showed generally stable reliability, the actual behaviors exhibited by the lifeguards may be different due to biases and measurement effects. Similarly, the internal consistency reliability of the scales used to assess perceived

severity of skin cancer and intentions were lower than the standard α of .7 as the cutpoint.

Another limitation exists in the measurement of sun protective behaviors which did not examine recent use of artificial tanning beds and sun lamps to tan the skin. Adolescent and young adult tanning bed use is an important factor to consider any time that research is done on skin cancer prevention in those populations.

Implications for Future Research

Although this research suggests some relationships of motivators and behaviors, it is important that research be done on the effectiveness of educational strategies in improving sun protective intentions and behaviors. Research into a variety of pedagogical approaches can help the cancer control community identify the most effective means of conveying messages that impact appearance threats as well as other motivational messages to the unique contexts that adolescent and young adult lifeguards work or spend their leisure time in. It will also be key to evaluate the effectiveness of appearance appeals to tanning bed use among this population as well as each of the recommended sun protective behaviors.

Another important area of research relates to developing a better understanding of the relationships of the motivations toward intention and behavior through conditional analyses of these variables. Analyses to assess variables such as age, gender, skin type or sensitivity and family history of skin cancer as moderators could provide key information for health educators to tailor messages to individuals in this population. In addition, by better understanding the role of skin tone dissatisfaction as a

moderator may also provide insight for health educators to better identify which populations are more likely to respond to a health message or an appearance message. The development of a short skin tone satisfaction assessment scale could be a powerful tool for researchers and practitioners.

Translation to Health Education Practice

Educational messaging through the extended parallel process model could be a powerful tool for health educators in the government, hospital and school settings to reduce the burden of skin cancer in the community. As lifeguards spend a great deal of time outdoors with a high percentage of their skin exposed to sunlight during peak hours, health educators could make an impact in sun protection by messaging appearance threats in conjunction with self-efficacy appeals as suggested by the model. The literature has a number of appearance related interventions [21-23] that could be used or tailored to meet the needs of the lifeguard community. A thorough needs assessment in the local aquatic community can build partnerships between health educators and stakeholders as well as identify specific barriers to sun protective behaviors that can be addressed as part of an intervention to increase self-efficacy when appearance appeals are used.

Available literature suggests [21-23] that educational interventions do not necessarily require multiple sessions to have an impact on behaviors. It appears that when appealing to key motivators in the target population, only a small educational dose is necessary to motivate improved sun protection behaviors. This suggests that even a short educational presentation could have positive impacts on sun protection in

the outdoor pool occupation and may translate to other employees of the pool community including junior lifeguards, water safety instructions, concessions and grounds employees and pool management.

However, a larger, more comprehensive partnership with the swimming facility can lead to even greater impacts. By working with pool management to consider sun protection when scheduling shifts and rotations, designing uniforms, investing in shade structures for lifeguard stations and employee break areas and budgeting for sunscreen for employees, health educators can aid in creating a sun safe environment in a swim facility that promotes a healthy body image and cancer prevention message. Health educators may also work with larger funding bodies for public facilities that implement policies that promote educational programs to gain access to more members of the aquatic community in their areas for which appearance messaging might be key in promoting sun protective behaviors that reduce the risk of skin cancer.

References

1. Rogers, HW, Weinstock, MA, Harris, AR, et al. Incidence estimate of nonmelanoma skin cancer in the United States, 2006. *Archives of Dermatology.* 2010; 146(3):283-287. doi: 10.1001/archdermatol.2010.19.

2. American Cancer Society. Cancer Facts and Figures 2014. http://www.cancer.org/acs/groups/content/@research/documents/webcontent/acspc-042151.pdf. Accessed April 16, 2014.

3. Devita, VT, Lawrence, TS, & Rosenberg, SA. *Cancer: Principles & Practice of Oncology, 9th Ed.* Philadelphia, PA: Lippencott Williams & Wilkins; 2011.

4. Reed, KB, Brewer, JD, Lohse, CM, et al. Increasing incidence of melanoma among young adults: An epidemiological study in Olmstead County, Minnesota. *Mayo Clinic Proceedings.* 2012;87(4):328-334. doi:10.1016/j.mayocp.2012.01.010.

5. American Academy of Dermatology. *How Do I Prevent Skin Cancer?* http://www.aad.org/spot-skin-cancer/understanding-skin-cancer/how-do-i-prevent-skin-cancer. Accessed April 16, 2014.

6. National Cancer Institute. *Cancer Trends Progress Report—2009/2010 Update: Sun Protection.* Bethesda, MD: National Institutes of Health, U.S. Department of Health and Human Services; 2012.

7. Eaton, DK, Kann, L, Kinchen, S. Youth risk behavior surveillance—United States, 2011. *MMWR Surveillance Summaries,* 2012;61(4):1–162.

8. Cohen, PH, Tsai, H, Puffer, JC. Sun-protective behavior among high-school and collegiate athletes in Los Angeles, CA. *Clinical Journal of Sport Medicine,* 2006;16(3):253-260.

9. Gies, P, Glanz, K, O'Riordan, D, et al. Measured occupational solar UVR exposures of lifeguards in pool settings. *American Journal of Industrial Medicine,* 2009;52:645-653. doi:10.1002/ajim.20722.

10. Merten, JW, Higgins, S, Rowan, A, et al. Sun safety knowledge, attitudes and behaviors among beachgoing adolescents. *American Journal of Health Education,* 2014;45:37-41. doi: 10.1080/19325037.2013.852997

11. Laffargue, JA, Merediz, J, Buhan, MM, et al. Sun protection questionnaire in Buenos Aires adolescent athletes. *Archivos Argentinos de Pediatria,* 2011;109(1):30-35. doi: 10.1590/S0325-00752011000100008.

12. Team, V, Markovic, M. Internet advertising of artificial tanning in Australia. *European Journal of Cancer Prevention,* 2006;15:371-376.

13. Cho, H, Hall, JG, Kosmoski, C, et al. Tanning, skin cancer risk, and prevention: A content analysis of eight popular magazines that target female readers, 1997-2006. *Health Communication,* 2010;25(1):1-10. doi: 10.1080/10410230903265938.

14. Dixon, H, Dobbinson, S, Wakefield, M, et al. Portrayal of tanning, clothing fashion and shade use in Australian women's magazines, 1987-2005. *Health Educator Research,* 2008;23(5):791-802.

15. SooHoo, S, Reel, JJ, Pearce, PF. Socially constructed body image of female adolescent cheerleaders. *Women in Sport and Physical Activity Journal.* 2011;20(2):22-34.

16. Banerjee, SC, Campo, S, Greene, K. Fact or wishful thinking? Biased expectations in "I think I look better when I'm tanned." *American Journal of Health Behavior.* 2008;32(3):243-253.

17. Yoo, JJ. Peer influence on adolescent boys' appearance management behaviors. *Adolescence.* 2009;44(176):1017-1031.

18. Reilly, A, Rudd, NA. Sun, salon and cosmetic tanning: Predictors and motives. *International Journal of Humanities and Social Sciences.* 2008;2(3):170-176.

19. Reynolds, D. Literature review of theory-based empirical studies examining adolescent tanning practices. *Dermatology Nursing.* 2007;19(5), 440-447.

20. Cafri, G, Thompson, JK, Jacobsen, PB, et al. Investigating the role of appearance-based factors in predicting sunbathing and tanning salon use. *Journal of Behavioral Medicine.* 2009;32:532-544. doi: 10.1007/s10865-009-9224-5.

21. Abar, BW, Turrisi, R, Hillhouse, J, et al. Preventing skin cancer in college females: Heterogeneous effects over time. *Health Psychology.* 2010;29(6):574-582. doi: 10.1037/a0021236.

22. Hillhouse, J, Turrisi, R, Stapleton, J, et al. A randomized controlled trial of an appearance focused intervention to prevent skin cancer. *Cancer.* 2008;113(11):3257-3266. doi: 10.1002cncr.23922.

23. Mahler, HIM, Kulik, JA, Gibbons, FX, et al. (2003). Effects of appearance-based interventions on sun protection intentions and self-reported behaviors. *Health Psychology.* 2003:22(2):199-209.

24. Witte, K. Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs.*1992;59:329-349.

25. Rogers, RW. A protection motivation theory of fear appeals and attitude change. *Journal of Psychology.* 1975;91:93-114.

26. Hovland, C, Janis, I, Kelly, H. *Communication and Persuasion*. New Haven, CT: Yale University Press. 1953.

27. Leventhal, H. Findings and theory in the study of fear communications. In L. Berkowitz (Ed.), *Advances in Experimental Social Psychology.* 1970;5:119-186.

28. Stephenson, MT, Witte, K. Fear, threat and perceptions of efficacy from frightening skin cancer messages. *Public Health Reviews.* 1998;26(2):147-174.

29. Rimal, RN, Real, K. Perceived risk and efficacy beliefs as motivators of change: Use of the risk perception attitude (RPA) framework to understand health behaviors. *Human Communication Research.* 2003;29:370-399.

30. Cho, H, Salmon, CT. Fear appeals for individuals in different stages of change: Intended and unintended effects and implications on public health campaigns. *Health Communication.* 2006;20(1):91-99.

31. Millar, M. G., & Houska, J. Masculinity and intentions to perform health behaviors: The effectiveness of fear control arguments. *Journal of Behavioral Medicine.* 2007;30:21-35.

32. Fitzpatrick, TB. Soleil et paeu. *Journal of Medical Esthetics.* 1975;2:33-34.

33. Azzarello, LM, Dessureault, S, Jacobsen, PB. (2006). Sun-protective behavior among individuals with a family history of melanoma. *Cancer Epidemiology, Biomarkers & Prevention.* 2006;15:142-145.

34. Faul, F, Erdfelder, E, Buchner, A, et al. Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods,* 2009;41: 1149-1160.

CHAPTER 5

SUMMARY, DISCUSSION AND CONCLUSION

The Feasibility Project

The purpose of this dissertation study was to determine the feasibility of a body image and implementation intentions intervention program to prevent skin cancer among adolescent and young adult lifeguards in outdoor swimming pool settings. Overall, the study results demonstrated the feasibility of such a project with a few considerations that will be outlined in this chapter.

Initially, this research intended to evaluate the Swimming Pool Lifeguard Actions Toward Skin Health (SPLASH) program conducted at twelve swimming pools with a 2x2 factorial design. However, due to a lack of buy in by pool managers, likely due to a busy summer season, a full sample of pools was not available. Also, the posttest was extremely ambitious in its length and only a handful of participants completed the posttest survey.

Body Image

According to the findings outlined in Chapter 4, a body image intervention would likely have effects on sun protection intentions and behaviors among lifeguards

in the area. As the sample drew lifeguards from seven swimming pools spanning a distance of around 100 miles, it seems clear that appealing to appearance threats of sun exposure would improve adherence to recommendations set forth by the American Academy of Dermatology.

Implementation Intentions Intervention

The implementation intentions intervention worksheets collected from the pool described in Chapter 3 provided the data for the qualitative descriptive article. Although there was only a small response to the posttest measurement, it seemed clear that the interactive and intentional nature of the activity provided lifeguards with the opportunity for reflection and application. It seems feasible that this technique could be helpful in increasing the lifeguard's sun protective behaviors and reduction in tanning bed use.

Recommendations

For a full project involving the pools, the following recommendations are presented:

- Consider approaching this program from a Community-Based Participatory Research (CBPR) paradigm involving pool managers, lifeguards and researchers from the beginning rather than as a needs assessment. There seems to be a significant interest among the aquatic community and more involvement in every phase of the project would likely increase buy in and dissemination of the program throughout the area. By identifying and including stakeholders from the

beginning, the program could be better tailored and adaptable to the aquatic and recreation culture.

- Along with the CBPR approach, consider developing the program using a peer education format with smaller, more adaptable modules that the pools can tailor to their own staffing and training needs.
- More carefully consider outcome measures for the posttest. Using the full 90-item questionnaire for the pretest only and utilize a shorter measurement for the posttest. Rather than measuring all of the motivators both times, it would likely be less time consuming if only outcome measures were included in the pretest or posttest. Although online resources are available and convenient, lifeguards might be more accessible for the posttest if conducted at the swimming facility where the pretest and intervention took place initially.
- Consider seeking grant funding to provide resources for training, printing materials, participant incentives and travel support for the research team, pool managers and lifeguards to attend meetings, engage in collaborations and build a sun safety infrastructure at the local pool facilities.

Athletes

Although the research was conducted among lifeguards, many lifeguards also compete in aquatic and other sports both inside and outside formal competition. It seems likely that many of these findings and recommendations may be informative for creating prevention programs tailored to the athlete population.

Conclusion

In conclusion, it is feasible to conduct a body image and implementation intentions intervention to promote skin health among adolescent and young adult lifeguards. A logical next step is to begin to assemble a coalition of stakeholders in the aquatic community to begin discussions about these findings. This coalition could begin assembling resources and organizing materials to adapt the SPLASH program to fit the outcomes of this research and the needs of the swimming facilities. This effort could continue to extend our knowledge of skin cancer prevention strategies and improve the skin health of members of the aquatic community.

APPENDIX A

SWIMMING POOL LIFEGUARD ACTIONS TOWARD SKIN HEALTH (SPLASH) QUESTIONNAIRE

Swimming Pool Lifeguard Actions toward Skin Health (SPLASH)

HUNTSMAN CANCER INSTITUTE
UNIVERSITY OF UTAH

SPLASH Questionnaire

Thanks for your willingness to participate in this research. Please answer the questions on the following pages honestly. Your information will be kept confidential and will not be shared with your supervisor. It should take about 30 minutes to complete this questionnaire.

Please print your name, phone number, and e-mail address below so we can contact you for a follow-up survey in about a month. We will separate this page from the rest of the survey to keep your answers confidential.

Name: _____

Phone: _____

E-mail: _____

Bring your completed questionnaire to the presentation scheduled at your pool on this date:

_____

About You

1. **How old are you?** _____ years old
2. **Are you**
   - ☐ Male
   - ☐ Female

   I identify myself as: _____

Skin Type

3. **After two hours in the sun without sunblock, what does your skin do?**
   - ☐ Burns, never tans
   - ☐ Burns easily, then develops light tan
   - ☐ Burns moderately, then develops light tan
   - ☐ Burns minimally, then develops moderate tan
   - ☐ Doesn't burn, develops dark tan
   - ☐ Doesn't burn; my skin is naturally dark

4. **What is your natural skin color?**
   - ☐ Very fair
   - ☐ Fair
   - ☐ Olive
   - ☐ Light brown
   - ☐ Dark brown

5. **How would you change your natural skin color, if you could?**
   - ☐ I wouldn't change my skin color at all.
   - ☐ I would make my skin naturally lighter.
   - ☐ I would make my skin naturally darker.

Personal History

6. **Have you ever been diagnosed with skin cancer?**
   - ☐ Yes
   - ☐ No

7. **Has your doctor ever told you to use tanning beds for a medical condition?**
   - ☐ Yes
   - ☐ No

Family History

8. **Has your mother, father, sister, or brother been diagnosed with melanoma?**
   - ☐ Yes
   - ☐ No

   If yes: **Is this person a blood relative?**
   - ☐ Yes
   - ☐ No

Tanning Behaviors

9. **Have you ever used a tanning bed?**
   - ☐ Yes
   - ☐ No

   If yes:
   - **About how many times in your entire life have you used a tanning bed or booth with tanning lamps?** _____ times
   - **How many times in the last 12 months have you used a tanning bed or booth?** _____ times
   - **How old were you the first time you used a tanning bed or booth?** _____ years old

10. **Have you ever used sunless tanning creams or lotions that you apply yourself?**
    - ☐ Yes
    - ☐ No

11. **Have you ever gotten a spray-on or mist tan at a tanning salon or other business?**
    - ☐ Yes
    - ☐ No

    If yes to question 10 or 11:
    - **How many times <u>in your entire life</u> have you used sunless tanning, the kind you applied by yourself or got at a business?** _____ times
    - **How many times <u>in the last 12 months</u> have you used sunless tanning, the kind you applied yourself or got at a business?** _____ times

Sun Protective Behaviors

For each question, please CIRCLE the word or phrase that best describes how often you did each behavior.

In the past month, how often did you...

Use sunscreen on your face?	Never	Rarely	Less than half the time	About half the time	More than half the time	Almost all the time	Always
Use sunscreen on your body?	Never	Rarely	Less than half the time	About half the time	More than half the time	Almost all the time	Always
Wear protective clothing?	Never	Rarely	Less than half the time	About half the time	More than half the time	Almost all the time	Always
Stay in the shade?	Never	Rarely	Less than half the time	About half the time	More than half the time	Almost all the time	Always
Wear sunglasses?	Never	Rarely	Less than half the time	About half the time	More than half the time	Almost all the time	Always

Your Intentions

Using the 1-5 scale below, please CIRCLE the number that best describes the extent to which you agree or disagree with each statement.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I intend to wear sunscreen on my face consistently in the next month.	1	2	3	4	5
I intend to wear sunscreen on my body consistently in the next month.	1	2	3	4	5
I intend to wear clothing consistently to protect my skin from the sun in the next month.	1	2	3	4	5
I intend to seek the shade consistently to protect my skin from the sun in the next month.	1	2	3	4	5
I intend to wear sunglasses consistently to protect my eyes from the sun in the next month.	1	2	3	4	5
I intend to avoid UV tanning beds consistently in the next month.	1	2	3	4	5

Your Attitudes and Beliefs

Using the 1-5 scale below, please CIRCLE the number that best describes the extent to which you agree or disagree with each statement. We are simply interested in your opinions. Please be as honest and accurate as possible.

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
The possibility of getting skin cancer worries me.	1	2	3	4	5
I don't need to worry about getting skin cancer until I am much older.	1	2	3	4	5
No matter what I do, I don't think that I am likely to get skin cancer.	1	2	3	4	5
I am too young to spend much time thinking that I might get wrinkles and age spots.	1	2	3	4	5
It would be terrible to have squamous cell skin cancer.	1	2	3	4	5
I don't need to worry about getting wrinkles and age spots until I am much older.	1	2	3	4	5
Having a tan now is not worth the wrinkles and age spots it might cause later.	1	2	3	4	5
I would not wear long sleeves or long pants while in the sun during summer months because it would be too hot.	1	2	3	4	5
I have more self-confidence when I have a tan.	1	2	3	4	5
I don't spend enough time in the sun to be concerned about getting wrinkles and age spots.	1	2	3	4	5
It's just too nice out during the summer to avoid going outdoors between 10 a.m. and 2 p.m.	1	2	3	4	5
The possibility of getting wrinkles and age spots worries me.	1	2	3	4	5
My health is too good right now to spend much time thinking that I might get skin cancer.	1	2	3	4	5
It would be terrible to have wrinkles on my face.	1	2	3	4	5
Having a tan now is too important to worry that it might cause wrinkles and age spots later.	1	2	3	4	5
Skin cancer is not a very serious disorder.	1	2	3	4	5

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
It would be terrible to have age spots on my face.	1	2	3	4	5
I would not use sunscreen regularly because it is too expensive.	1	2	3	4	5
It would be terrible to have wrinkles on my arms, neck, and/or hands.	1	2	3	4	5
I think I look healthier when I have a tan.	1	2	3	4	5
Hanging around the pool or at the beach with friends on a sunny summer day is just too nice to pass up.	1	2	3	4	5
Whenever I hear of a friend or relative (or public figure) getting skin cancer, it makes me realize that I could get it too.	1	2	3	4	5
Using sunscreen regularly is just too much trouble.	1	2	3	4	5
I would not wear long sleeves or long pants while in the sun during summer months because it would prevent me from getting "some color."	1	2	3	4	5
I can think of numerous things that would be worse than having wrinkles or age spots.	1	2	3	4	5
I believe that there is a real possibility that I will someday develop a lot of wrinkles and age spots.	1	2	3	4	5
The older I get, the more I think about the possibility of getting wrinkles and age spots.	1	2	3	4	5
I don't spend enough time in the sun to worry about getting skin cancer.	1	2	3	4	5
It would be terrible to have malignant melanoma.	1	2	3	4	5
I would not use sunscreen regularly because I like to be tan.	1	2	3	4	5
I would not use a wide-brimmed hat because it would not look good on me.	1	2	3	4	5
Whenever I see a friend or relative who has a lot of wrinkles or age spots, it makes me realize I could get them too.	1	2	3	4	5

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I would not use sunscreen regularly because it is too messy.	1	2	3	4	5
I would not use sunscreen regularly because it is too greasy.	1	2	3	4	5
Having a tan is not worth the damage it causes to my skin.	1	2	3	4	5
I feel more attractive when I have a tan.	1	2	3	4	5
It would be terrible to have basal cell skin cancer.	1	2	3	4	5
No matter what I do, I don't think it is likely that I am going to have many wrinkles or age spots.	1	2	3	4	5
It is very important to me to have a tan.	1	2	3	4	5
It would be terrible to have skin cancer of any kind.	1	2	3	4	5
I try to have some tan all year round.	1	2	3	4	5
The older I get the more I think about the possibility of getting skin cancer someday.	1	2	3	4	5
I would not use sunscreen regularly because I often forget to use it.	1	2	3	4	5
Having a tan is worth it even if it results in some skin damage.	1	2	3	4	5
I can think of numerous things that would be worse than having skin cancer.	1	2	3	4	5
Wrinkles and age spots add character to a face.	1	2	3	4	5
I believe there is a real possibility that I will someday develop some kind of skin cancer.	1	2	3	4	5
It would be terrible to have age spots on my arms, neck, and/or hands.	1	2	3	4	5
I would not wear a wide-brimmed hat while at the beach or in the sun because it would be too hot.	1	2	3	4	5
Most people look better with a tan.	1	2	3	4	5

Your Confidence and Motivation

Below is a list of things people might do when using sunscreen. Please answer these questions whether you presently sunbathe or not and whether you currently use sunscreen or not. There are no right or wrong answers—only what is true for you. We ask only that you answer as honestly and accurately as possible.

Using the 1-10 scale below, please CIRCLE the number next to each statement that shows how confident you are that you could motivate yourself to do that activity.

I could…	Certain I could not do			I probably could not do		I probably could do			Certain I could do	
…use sunscreen while sunbathing even if I already have a base tan.	1	2	3	4	5	6	7	8	9	10
…use sunscreen while sunbathing even though other people I am with are not using it.	1	2	3	4	5	6	7	8	9	10
…use sunscreen while sunbathing even when I am feeling pale.	1	2	3	4	5	6	7	8	9	10
…use sunscreen even though it needs to be reapplied often.	1	2	3	4	5	6	7	8	9	10
…make using sunscreen a part of my daily routine, like brushing my teeth.	1	2	3	4	5	6	7	8	9	10
…use sunscreen even when I'm feeling too lazy to bother with it.	1	2	3	4	5	6	7	8	9	10
…use sunscreen even though I'm going to a party for which I would like to look tan.	1	2	3	4	5	6	7	8	9	10
…say encouraging things to myself about the benefits of using sunscreen even when I think I would look healthier with a tan.	1	2	3	4	5	6	7	8	9	10
…use sunscreen even if I am going out that night and want to be tan.	1	2	3	4	5	6	7	8	9	10
…use sunscreen even if my friends tell me I look healthier with a tan.	1	2	3	4	5	6	7	8	9	10
…use sunscreen even if people tell me I don't need it.	1	2	3	4	5	6	7	8	9	10
…remind myself of the benefits of using sunscreen when other people tell me I don't need it.	1	2	3	4	5	6	7	8	9	10

APPENDIX B

INFORMED CONSENT, ASSENT AND PARENTAL PERMISSION FORMS

Consent Document

BACKGROUND
You are being asked to take part in a research study. Before you decide it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you want to volunteer to take part in this study. The purpose of the study is to find better ways to teach lifeguards about the risk of skin cancer and how to prevent it.

STUDY PROCEDURE
It will take you about 2 hours to complete this study. As part of this study you will be asked to complete a questionnaire, attend an educational presentation, and complete a second questionnaire four weeks later. Questions will be asked about you, your skin, steps you take to protect your skin from the sun, your use of artificial tanning, and some of your beliefs about skin cancer. The educational program you will participate in has techniques that are generally used to teach lifeguards and some that are new and experimental. Your pool will be assigned to a training program and you will not be able to choose which one you receive.

RISKS
The risks of this study are minimal. You may feel upset thinking about or talking about personal information related to skin cancer. These risks are similar to those you experience when discussing personal information with others. If you feel upset from this experience, you can tell the researcher, and he will tell you about resources available to help.

BENEFITS
We cannot promise any direct benefit for taking part in this study. However, possible benefits include learning more about how to make informed decisions about protecting your skin against skin cancer and finding it early. We hope the information we get from this study may help develop a greater understanding of how to prevent skin cancer in the future.

ALTERNATIVE PROCEDURES
If you do not want to take part in the study, you may still participate in the educational activities without participating in the questionnaires.

CONFIDENTIALITY
We will keep all research records that identify you private to the extent allowed by law. Records about you will be kept in a locked filing cabinet and on computers protected with passwords and encryption. Only those who work with this study or are performing their job duties for the University of Utah will be allowed access to your information. Your name will be kept with your responses from the questionnaire. In publications, your name will be removed.

PERSON TO CONTACT
If you have questions, complaints or concerns about this study, you can contact Jeff Yancey at 801-581-4945 or jeff.yancey@hci.utah.edu. If you feel you have been harmed as a result of

participation, please call Jeff Yancey at 801-581-4945 or jeff.yancey@hci.utah.edu who may be reached during regular business hours.

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.

Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
It is up to you to decide whether to take part in this study. Refusal to participate or the decision to withdraw from this research will involve no penalty or loss of benefits to which you are otherwise entitled. This will not affect your relationship with the investigator.

COSTS AND COMPENSATION TO PARTICIPANTS
There will be no cost to you to participate in this research. There is no compensation for this study, however, you will be entered into a drawing for completing each questionnaire as part of this research. At the end of the study, names will be drawn to receive one of five $10 iTunes gift cards.

CONSENT
By signing this consent form, I confirm I have read the information in this consent form and have had the opportunity to ask questions. I will be given a signed copy of this consent form. I voluntarily agree to take part in this study.

_____
Printed Name of Participant

_____ _____
Signature of Participant Date

_____
Printed Name of Person Obtaining Consent

_____ _____
Signature of Person Obtaining Consent Date

Assent to Participate in a Research Study

Who are we and what are we doing?
We are from the Huntsman Cancer Institute at the University of Utah. We would like to ask if you would be in a research study. A research study is a way to find out new information about something. This is the way we try to find out how lifeguards learn about skin cancer risk.

Why are we asking you to be in this research study?
We are asking you to be in this research study because we want to learn more about the best way to teach lifeguards about ways to take care of their skin. We want you to be in this study because as a lifeguard, you spend long hours exposed to the sun, which might put you at risk of developing skin cancer later in your life.

What happens in the research study?
If you decide to be in this research study and your parent or guardian agrees, we will have you do the following:

- We will give you a questionnaire to fill out.
- We will ask you to participate in an educational presentation.
- Four weeks later, we will have you fill out the questionnaire again.

Will any part of the research study hurt you?
There is a chance that during this research study you could feel afraid, uncomfortable, or hurt. We will try to help you feel better if this happens. You can stop at any time if you want to. The questions we ask might make you feel nervous about your risk of developing skin cancer.

Will the research study help you or anyone else?
We do not know for sure if being in this research study will help you. It is possible that we could learn something to help other lifeguards learn how to better protect their skin.

Who will see the information about you?
Only the researchers or others who are doing their jobs will be able to see the information about you from this research study.

What if you have any questions about the research study?
It is okay to ask questions. If you don't understand something, you can ask us. We want you to ask questions now and anytime you think of them. If you have a question

later that you didn't think of now, you can call Jeff Yancey at 801-581-4945 or e-mail him at jeff.yancey@hci.utah.edu or ask us the next time we see you.

Do you have to be in the research study?
You do not have to be in this study if you don't want to. Being in this study is up to you. No one will be upset if you don't want to do it. Even if you say yes now, you can change your mind later. You can take your time to decide. You can talk to your parent or guardian before you decide. We will also ask your parent or guardian to give their permission for you to be in this study. But even if your parent or guardian says "yes" you can still decide not to be in the research study. If you choose not to participate in the study, you can still participate in the educational activities if you want to.

Agreeing to be in the study
I was able to ask questions about this study. Signing my name at the bottom means that I agree to be in this study. My parent or guardian and I will be given a copy of this form after I have signed it.

_____
Printed Name

_____ _____
Sign your name on this line Date

_____
Printed Name of Person Obtaining Assent

_____ _____
Signature of Person Obtaining Assent Date

The following should be completed by the study member conducting the assent process if the participant agrees to be in the study. Initial the appropriate selection:

_____ The participant is capable of reading the assent form and has signed above as documentation of assent to take part in this study.

_____ The participant is not capable of reading the assent form, but the information was verbally explained to him/her. The participant signed above as documentation of assent to take part in this study.

Parental Permission Document

BACKGROUND

Your child is being asked to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether you will allow your child to take part in this study.

The purpose of the study is to learn better ways to teach lifeguards about how to protect their skin from skin cancer.

STUDY PROCEDURE

It will take your child about 2 hours to complete this study. As part of the study, your child will be asked to complete a questionnaire, attend an educational presentation, and complete a second questionnaire four weeks later. The questionnaires will ask your child about their skin, how they protect their skin from the sun, their use of artificial tanning, and some of their beliefs about skin cancer. The educational program your child will participate in has techniques that are generally used to teach lifeguards and some that are new and experimental. Your child's pool will be assigned to a training program and you will not be able to choose which one your child receives.

RISKS

The risks of this study are minimal. Your child may feel upset thinking about or talking about personal information related to skin cancer. These risks are similar to those experienced when discussing personal information with others. If your child feels upset from this experience, you or your child can tell the researcher, and he/she will tell you about resources available to help.

BENEFITS

We cannot promise any direct benefit for taking part in this study. However, possible benefits include your child learning more about how to make informed decisions about protecting his or her skin against skin cancer and finding it early. We hope the information we get from this study may help develop a greater understanding of how to prevent skin cancer in the future.

ALTERNATIVE PROCEDURES

If you do not wish that your child participates in this study, he or she is still welcome to participate in the educational activities without completing the questionnaires.

CONFIDENTIALITY

We will keep all research records that identify your child private to the extent allowed by law. Records about your child will be kept in a locked filing cabinet and on computers protected with passwords and encryption. Only those who work with this study or are performing their job duties for the University of Utah will be allowed access to your child's information. Your

child's name will be kept with his or her responses from the questionnaire. In publications, your child's name will be removed.

PERSON TO CONTACT If you have questions, complaints or concerns about this study, you can contact Jeff Yancey at 801-581-4945 or jeff.yancey@hci.utah.edu. If you feel you have been harmed as a result of participation, please call Jeff Yancey at 801-581-4945 or jeff.yancey@hci.utah.edu who may be reached during regular business hours.

Institutional Review Board: Contact the Institutional Review Board (IRB) if you have questions regarding your rights as a research participant. Also, contact the IRB if you have questions, complaints or concerns which you do not feel you can discuss with the investigator. The University of Utah IRB may be reached by phone at (801) 581-3655 or by e-mail at irb@hsc.utah.edu.
Research Participant Advocate: You may also contact the Research Participant Advocate (RPA) by phone at (801) 581-3803 or by email at participant.advocate@hsc.utah.edu.

VOLUNTARY PARTICIPATION
It is up to you to decide whether to allow your child to take part in this study. Refusal to allow your child to participate or the decision to withdraw your child from this research will involve no penalty or loss of benefits to which your child is otherwise entitled. This will not affect your or your child's relationship with the investigator.

COSTS AND COMPENSATION TO PARTICIPANTS
There will be no cost to you or your child for participating in this research. There is no compensation for participation, however your child's name will be entered into a drawing for each of the questionnaires he or she completes. The prize for this drawing will be one of five $10 iTunes gift cards.

CONSENT
By signing this consent form, I confirm I have read the information in this parental permission form and have had the opportunity to ask questions. I will be given a signed copy of this parental permission form. I voluntarily agree to allow my child to take part in this study.

_____
Child's Name

_____
Parent/Guardian's Name

_____ _____
Parent/Guardian's Signature Date

_____
Relationship to Child

_____
Name of Person Obtaining Consent

_____ _____

Signature of Person Obtaining Consent Date

APPENDIX C

SWIMMING POOL LIFEGUARD ACTIONS TOWARD SKIN HEALTH (SPLASH) INSTRUCTOR'S MANUAL

Swimming Pool Lifeguard Actions toward Skin Health (SPLASH)

Facilitator's Manual

Introduction

Welcome to the Swimming Pool Lifeguard Actions toward Skin Health (SPLASH) program. This program is intended to help lifeguards manage their risk of developing skin cancer through prevention education.

This manual is for use by instructors within the SPLASH program to provide with information and teaching tools to provide education to lifeguards about skin health. This program is developed by the University of Utah, Department of Health Promotion and Education and Huntsman Cancer Institute.

How to Use this Manual

This manual is divided into three sections: Administration, Lesson Plans and Appendices. The administration section describes the SPLASH program and provides information in administering the educational activities in the program. The Teaching Tools section provides specific lesson plans to deliver the information to the lifeguards. The Appendices provide resources that may be photocopied and handed out to the participants in the program as well as additional information for program directors and instructors.

Section 1: Administration

Program Purpose

The purpose of the SPLASH program is to provide an interactive and applicable group learning experience for lifeguards to enhance their perceived control over their own skin health. The program intends to reduce the burden of skin cancer on the lifeguarding community and community in general by teaching prevention and early detection strategies.

The SPLASH program is being conducted as a feasibility research program evaluating the effectiveness of a body image/appearance intervention and an implementation intentions intervention on preventing skin cancer. Specific lesson components, objectives and messaging will be determined by the body image and implementation intentions components of the program. Pools will be randomly assigned into one of four groups where the specific intervention will be given. All of the lifeguards working at a facility will receive the same educational program.

Program Design

This program is driven by Witte's (1998) Extended Parallel Process Model (EPPM). This model states that an individual is more likely to accept an educational message when a person has both a high perception of perceived threat (perceived susceptibility + perceived severity) combined with a high level of a perceived sense of control over the situation or efficacy (perceived self-efficacy + perceived response efficacy). *Figure 1* shows how the EPPM is applied to the SPLASH program.

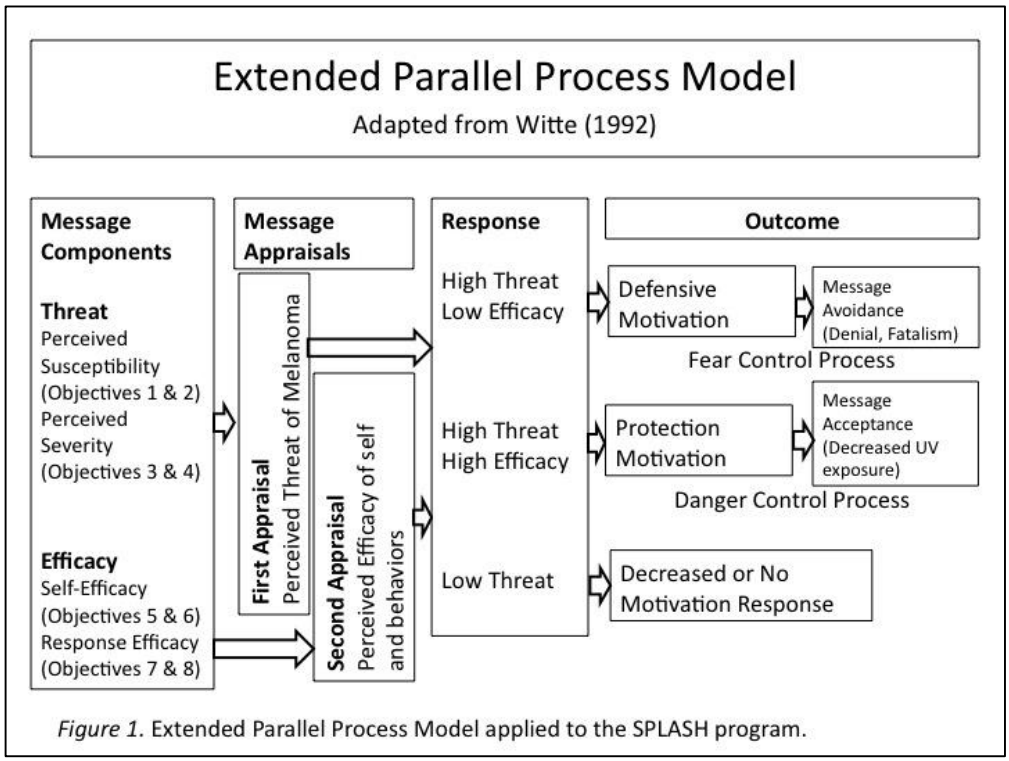


Figure 1. Extended Parallel Process Model applied to the SPLASH program.

If a person only sees the high level of threat without a sense of efficacy, it is more likely that they will have the emotional response of fear and use a defensive way of trying to control that emotion. This could be in the form of denial or fatalism (Rippetoe & Rogers, 1987) rather than accepting the message and creating intentions to change. Of course, if the person doesn't perceive a threat by the educational messages, he or she will not likely feel motivated to make any changes at all.

This program will use interactive educational activities, handouts, posters, videos and games to help participants construct educational messages based on a set of learning objectives developed from constructs the Extended Parallel Process Model.

Program Messaging

To increase perceived threat and perceived efficacy, this program draws messages from the research literature with regard to skin cancer prevention and early detection.

Threat

The American Cancer Society (2012) estimates that there are about 3.5 million cases of skin cancer in the United States every year. Many of these cancers are basal-cell and squamous-cell carcinomas that if left untreated can cause severe health problems. A small portion of these cancers is a specific type of skin cancer known as melanoma, which if not discovered and treated quickly can be deadly. Basal and squamous cell carcinomas are not as deadly as melanoma, and account for about 3,010 deaths annually (Skin Cancer

Foundation, 2012). The American Cancer Society (2012) estimates that 76,250 new cases of melanoma will be diagnosed this year and 9,180 people will die of the disease in the United States. Although only accounting for 5% of all new skin cancer cases, melanoma accounts for 79% of all skin cancer related deaths. A disturbing trend is the increasing incidence of melanoma among young adults (Reed, et al, 2012).

Common risk factors for all types of cancer include behavioral factors such as exposure to UV radiation through sunlight or artificial tanning beds, personal factors including fair skin that burns easily, green, blue or gray eyes, blond or red hair and a large number of freckles on the skin. Having a medical history of severe sunburn, suppressed immunity or the use of some antibiotics, hormones and antidepressants also increase the risk of developing skin cancer. Melanoma can also be linked to a personal or family history of melanoma or other inherited skin conditions. (National Cancer Institute, 2012).

Messages intended to increase perceived threat will include:

3) Identification of specific risk factors such as skin tone and hair color, personal and familial medical history and behaviors such as sun seeking and tanning bed use. (Susceptibility)
4) Understanding the deadliness of melanoma skin cancer in constrast to non-melanoma types. (Severity)

Additional messages to enhance the perceived threat will be drawn from the effects that UV radiation can have on an individual's appearance. A well-known phenomenon is the damaging influence UV radiation on connective tissue structure within the dermis layer of the skin leading to pigmentation changes, loss of elasticity and a more generalized wrinkled and aged appearance (Kligman, 1986). Additionally, surgical, medical, biological and radiation treatments to the skin can result in changes in skin appearance including alopecia, scarring and, at times, removal/reconstruction of facial features or limbs (American Cancer Society, 2012).

Messages intended to increase perceived threat on appearance:

3) UV radiation contributes to the skin aging process and appearance. (Susceptibility)
4) Skin cancer treatment can lead to significant impacts on skin and overall body appearance including scarring and disfigurement. (Severity)

Efficacy

Limiting exposure to the sun and other sources of UV radiation is the primary preventative measure for skin cancer (CDC, 2006). The American Academy of Dermatology (2009) recommends seven behaviors for preventing skin cancer. These steps include avoiding intentional tanning, seeking dietary sources for vitamin D, consistently applying and reapplying appropriate and clinically developed sunscreen products to all exposed areas of the body. Additionally, the AAD recommends that

individuals stay covered with protective clothing, hats and sunglasses, seek out shady areas, and use caution around reflective environments such as snow, water and sand.

The Skin Cancer Foundation (2012) recommends that individuals over the age of 18 have a full-body skin exam annually by a dermatologist as part of a regular physical exam. Many physicians offer mole mapping as a way of tracking changes in moles for individuals with several moles in places that are difficult to see. Mole mapping involves using high resolution photography to record each mole to be compared during regular skin screening exams.

Additionally, the Skin Cancer Foundation recommends full body self or partner exams performed on a monthly basis to detect signs of skin cancer. The Skin Cancer Foundation (2012) recommends the ABCDE method of identifying suspicious spots on the skin. This method recommends that individuals follow the mnemonic to identify spots that are asymmetrical, an unusual border, more than one color, a diameter greater than a pencil eraser or changing or evolving over time. The Skin Cancer Foundation (2012) also recommends "the ugly duckling" approach for individuals with many moles. This approach has individuals look for a spot that looks different from the other spots rather than looking at specific characteristics of the mole itself.

Messages intended to increase perceived efficacy include:

5) Simplicity and accessibility of behaviors to prevent skin cancer including shade seeking, use of protective clothing, sunblock use, wearing sunglasses, avoiding sun seeking, and avoiding tanning bed use. (Self Efficacy)
6) Simplicity and accessibility of performing early detection strategies including skin self-exams, partner skin exams and obtaining a full body skin exam from a dermatologist. (Self Efficacy)
7) Effectiveness of skin protective behaviors. (Response Efficacy)
8) Effectiveness of early detection strategies. (Response Efficacy)

Program Objectives

Using each motivator from the EPPM, this program has specific objectives to be accomplished by the end of the session. Two objectives have been established for perceived susceptibility (Objectives 1 & 2), perceived severity (Objectives 3 & 4), perceived self-efficacy (Objectives 5 & 6) and perceived response efficacy (Objectives 7 & 8).

Objective 1: By the end of the program, participants will be able to identify 4 ways they are at risk of UV radiation negatively impacting their health.

Objective 2: By the end of the program, participants will be able to identify 2 ways they are at risk of UV radiation negatively impacting their appearance.

Objective 3: By the end of the program, participants will be able to list 3 specific and serious health effects of skin cancer.

Objective 4: By the end of the program, participants will be able to list 2 specific and serious appearance effects of skin cancer.

Objective 5: By the end of the program, participants will be able to perform 4 actions to prevent skin cancer.

Objective 6: By the end of the program, participants will be able to perform 2 actions to find skin cancer early.

Objective 7: By the end of the program, participants will be able to identify 4 actions that effectively prevent skin cancer.

Objective 8: By the end of the program, participants will be able to identify 2 actions that effectively detect skin cancer early.

Note: Each objective will be evaluated based on techniques established by each lesson plan.

Program Format

The SPLASH program is formatted in a way to provide an effective in-service educational program for lifeguards while evaluating the influence that a body image intervention and implementation intentions intervention has on the attitudes and behaviors of the participants. The research conducted on this program results in individual pools being randomly assigned to one of four groups.

Group 1: SPLASH Only (Lessons 1, 2, 3, 4)
Group 2: SPLASH + Body Image (Lessons 1, 2, 3, 5)
Group 3: SPLASH + Implementation Intentions (Lessons 1, 2, 3 with enhancements)
Group 4: SPLASH + Body Image + Implementation Intentions (Lessons 1, 2, 5 with enhancements)

The SPLASH program is designed to be flexible as a one-hour educational session or divided into smaller components that can be done over several days. The specific educational modules and length of modules will vary depending on the research treatment pools are randomized into. Pools randomized into the SPLASH only or SPLASH + Body Image groups (Groups 1 & 2) will receive four, 15-minute educational activities. Pools receiving the implementation intention interventions (Groups 3 & 4) will receive three, 20-minute educational components that include 5 minute long enhancements.

Instructional Philosophy and Strategy

Traditionally, skin cancer education has been conducted through a presentation style, instructor-led approach where key points of education pertaining to risk and risk reduction have been conveyed from expert to student. The SPLASH program utilizes a constructivist approach where the goal is not to convey knowledge, but to construct meaning based on knowledge.

It is likely that most lifeguards have a fair understanding of skin cancer risk and prevention steps, regardless of their application of those steps. The SPLASH program reintroduces those steps, but does so in an interactive fashion intended to aid the participant in internalizing that information and applying it to his or her own situation and circumstances.

As a facilitator, the SPLASH program provides opportunities to teach in a broad continuum of methods including direct instruction, leading discussions, and having students work in task-based group assignments remembering that the knowledge and meaning is derived at the participant level in the social context of the group and the environmental context of the pool.

Howard Gardner (1985, 1993) developed a theory that intelligence can exist in several domains. These domains included areas such as logical-mathematical, spatial, interpersonal, intrapersonal, linguistic, musical, naturalistic and existential domains. Another domain he includes in his theory is bodily-kinesthetic where learning is most likely to occur in physical action and activity. It is likely that the athletic nature of lifeguarding with its rigorous physical requirements has a higher number of individuals with a high level of bodily-kinesthetic intelligence. Many of the learning strategies in SPLASH are intended to access that intelligence and learning style.

To aid participants in the SPLASH program accomplish goals they have set for themselves in preventing skin cancer, some lesson plans will include implementation intentions Gollwitzer (1999). As a facilitator, you will help the lifeguards determine what their intentions are for preventing skin cancer. Then you will help them identify and address barriers they face by creating statements in the form “when situation *x* arises, I will perform response *y*.” Gollwitzer states that this process helps behaviors become more automatic.

Lesson Plans

The lesson plans section of this manual includes individual lesson plans for each of the modules in the SPLASH program. Each lesson plan includes the title of the lesson, objectives covered in the lesson, materials and supplies needed, detailed lesson outline and evaluation process.

Section II: Lesson Plans

If you are teaching…			
Group 1	Group 2	Group 3	Group 4
Then you will teach…			
Lesson 1 (15 minutes) Lesson 2 (15 minutes) Lesson 3 (15 minutes) Lesson 4 (15 minutes)	Lesson 1 (15 minutes) Lesson 2 (15 minutes) Lesson 3 or 4 (15 minutes) Lesson 5 (15 minutes)	Lesson 1+Add on (20 minutes) Lesson 2+Add on (20 minutes) Lesson 3 or 4 +Add on (20 minutes)	Lesson 1+Add on (20 minutes) Lesson 2+Add on (20 minutes) Lesson 5+Add on (20 minutes)

Italics will be used when referencing components or steps where the implementation intentions add-ons will be used.

Lesson 1: Dear 16-Year Old Me

Objectives:
Objective 1: By the end of the program, participants will be able to identify 4 ways they are at risk of UV radiation negatively impacting their health.
Objective 3: By the end of the program, participants will be able to list 3 specific and serious health effects of skin cancer.
Objective 7: By the end of the program, participants will be able to identify 4 actions that effectively prevent skin cancer.
Objective 8: By the end of the program, participants will be able to identify 2 actions that effectively detect skin cancer early.

Materials and Supplies:
Computer, Projector and Screen, Speakers
Dry-Erase or Chalkboard with Markers/Chalk
Handouts (If using add-ons)

Lesson Outline

Introduce Self.

- Give your name, background. Share a little bit about yourself.
- State you are from Huntsman Cancer Institute.

Introduce SPLASH.

- Explain that this is an educational program from Huntsman Cancer Institute and the Department of Health Promotion and Education.
- This program is intended to help lifeguards learn how to better protect their skin from UV radiation.
- Explain that this program has (*3 if using add-on* or 4) lessons that you will be doing (that day or in a series of visits to the pool).

Introduce Lesson.

- State that you are going to show a short video clip about skin cancer.
- During the video, watch for some of the health effects of skin cancer or skin cancer treatment. Also watch for ways you can find skin cancer early.
- Write on the board the following:

How Am I At Risk?
Dangers of Skin Cancer
How to Prevent It
How to Find It Early

- Invite participants to call out what they find in the video.

Show Video *Dear 16-Year Old Me (5:04)*
http://www.youtube.com/watch?v=_4jgUcxMezM

- Write student responses on the board.

Discussion

- Discuss the video by asking questions such as…

What did you learn from this video? How did this video make you feel? What does this video make you want to do differently? If you made a video called "Dear 12-year Old Me" what would you say? Are there things you want to add to the list? Which dangers of skin cancer do you think are most serious? Which ways to prevent or find skin cancer early are easiest or hardest to do? What can your pool do to help? What can Huntsman Cancer Institute do to help?
Evaluation Students are able to list on the board 4 health effects, mark 3 of them serious. Students are also able to list 4 ways to prevent skin cancer and 2 ways of finding it early.
Implementation Intention Add-on *The implementation intentions intervention add-on will be done in three steps. Step 1 is to identify what the intention or goal is, step 2 is to identify barriers to accomplishing that intention and step 3 is to work as individuals and as a team to remove barriers that impede that intention.* *Using the Handout in Appendix A guide the lifeguards through the process of stating their intentions or goals. It should be something that they can actually do or not do, be specific, time limited and should be something that each person derives individually.* *After participants have written their intentions or goals, ask two or three who are willing and comfortable doing so, to share them with the group.*

Lesson 2: Risk and Reduction

Objectives:

- ☐ Objective 1: By the end of the program, participants will be able to identify 4 ways they are at risk of UV radiation negatively impacting their health.
- ☐ Objective 3: By the end of the program, participants will be able to list 3 specific and serious health effects of skin cancer.
- ☐ Objective 5: By the end of the program, participants will be able to perform 4 actions to prevent skin cancer.
- Objective 7: By the end of the program, participants will be able to identify 4 actions that effectively prevent skin cancer.

Materials and Supplies:
A small plastic or rubber football.
If conducting this activity in the pool, have a lifeguard on duty with adequate equipment.
Handouts (If using add on)

Lesson Outline

Introduce Lesson.

- If you need to, reintroduce yourself.
- Introduce this lesson as an activity to better understand risk
- Challenge the guards that they will need to toss the ball to each other 100 items to complete the challenge. If the ball hits the water (or the ground) you start over.

Activity.

- Have all of the lifeguards stand in a circle on the deck or in the pool (if in the pool, you must have a lifeguard on duty).
- Hand one of them the ball and tell them that they must throw the ball to each other. Each time the ball is successfully passed to each other, they earn a point. To complete the challenge, 100 points are required.
- If the ball hits the water or deck, they must start over.
- Eventually, the lifeguards will start making eye contact, communicating better, throwing the ball softer. They may even just start handing the ball to each other. Start applying social pressure to them to live a little and enjoy the thrill.

Discussion

- ☐ Facilitate a discussion with the guards about what some of the risks were of being unsuccessful. You might use some of the following questions:
  What made this task difficult?
  What were some of the risk factors of the ball hitting the water?
  What did you do to lower some of those risks?
  What role did your peers or facilitator have in taking or not taking risks?
  How does this apply to skin cancer risk?

Which skin cancer prevention steps are easier because of peers or harder because of peers? Summarize ☐ Have students get in pairs and state 4 specific ways they can lower their risk. Ask two or three individuals to share what their partner told them.
Evaluation Participants should be able to list at least 4 ways they can prevent skin cancer. Use the summarize activity to assess learning.
Implementation Intention Add-on *Guide students through step 2 of the implementation intentions worksheet. This time, have them work in pairs to discuss specific barriers to accomplishing their goals.* *Ask 2-3 groups to share an example of their steps for the whole class.*

Lesson 3: Sun Safe Relay

Objectives:

- Objective 5: By the end of the program, participants will be able to perform 4 actions to prevent skin cancer.
- Objective 7: By the end of the program, participants will be able to identify 4 actions that effectively prevent skin cancer.

Materials and Supplies

Box of sun protection materials per 5-6 lifeguards. Each box should include a shirt that covers the shoulders, wide-brimmed hat, sunglasses, sunblock.
Whistle
Melanoma-Know the Danger Signs for each lifeguard.
Handouts (If using add-on)

Lesson Outline

Introduce Lesson

- If necessary, reintroduce self.
- Explain that this activity is to practice behaviors that reduce skin cancer.
- This is a relay race. Review the sun protection steps on *Melanoma-Know the Danger Signs* with the class.

The Race

- Separate lifeguards into teams of 5-6. If you have a lifeguard on duty, you can have the guards swim the length of the pool as part of the relay.
- Guards will race to dress in protective clothes, apply sunblock to exposed skin and answer a question about prevention. The first team to get through the relay wins.
- Questions you might ask during the relay:
  What are peak hours in the day?
  There is such thing as a healthy tan. True or False?
  Sunblock should have at least a minimum SPF of what number?
  What chemicals should you find in sunblock?
  Which is better clothing or sunblock?
  Can you get sunburned in the shade?
  Where are you more likely to get UV radiation, a Hawaiian beach, a Salt Lake City pool or Mt. Timanogos?
  When should you open the umbrella on the guard stand?
  How often should you reapply sunblock?
  Green eyes make you at higher risk?
  Tanning for a base tan prevents sunburns. T or F?

Evaluation

Most lifeguards answer the prevention questions correctly.
Implementation Intention Add-on *Now complete step 3 on the worksheet. This step states specifically what to do when facing those barriers. Have lifeguards work in groups of 5-6 to brainstorm ideas. Have each group share an example they came up with.*

Lesson 4: Find a Mole

Objectives

- Objective 6: By the end of the program, participants will be able to perform 2 actions to find skin cancer early.
- Objective 8: By the end of the program, participants will be able to identify 2 actions that effectively detect skin cancer early.

Materials and Supplies
Washable markers
Melanoma-Know the Danger signs for each participant
Handouts if using add-ons

Lesson Outline

Introduction.

- If necessary, reintroduce yourself.
- Explain that you will be learning about finding skin cancer early.
- Review the ABCDE steps on Melanoma—know the danger signs.

Find a Mole

- Ask for 3-4 volunteers. Have them go into the first aid room and draw about 10 moles on their skin with the markers. Have them draw one that fits the ABCDE steps. Be sure to instruct them to draw them on places on their skin that isn't covered by a swimsuit (for obvious reasons).
- Allow the participants to mingle to see if they can spot the suspicious mole.
- After the moles have been spotted, have students explain why those moles are suspicious using ABCDE.

Discussion

- Discuss self-exams, partner exams and physician exams. Have students make a plan for screening. Ask the following questions:
  Why is it important to find cancer early?
  What might make this difficult?
  What might make this easy?
  Where can you go if you have questions about skin cancer?
  What can you do to encourage your co-workers to get screened for skin cancer?

Evaluation
During the discussion, participants will adequately explain the need for and difficulty accessing physician screening on an annual basis.

Implementation Intention Add-on

Now complete step 3 on the worksheet. This step states specifically what to do when facing those barriers. Have lifeguards work in groups of 5-6 to brainstorm ideas. Have each group share an example they came up with.

Lesson 5: Love Your Skin

Objectives:

- ☐ Objective 2: By the end of the program, participants will be able to identify 2 ways they are at risk of UV radiation negatively impacting their appearance.
- ☐ Objective 4: By the end of the program, participants will be able to list 2 specific and serious appearance effects of skin cancer.

Materials and Supplies
Skin Scope Machine
Melanoma-Know the Danger Signs for each participant
Handout (If using add-on)

Lesson Outline

Introduction

- Introduce yourself if necessary
- Explain that you have brought a machine that can show the damage the sun has already caused.
- Discuss the *Melanoma-Know the Danger Signs* card.

The Skin Scope
Have each lifeguard sit in the skin scope. Point out areas of skin damage, areas where SPF make up might be protecting the skin and if applicable, marks in the eyes.
Allow all of the lifeguards to see their skin under the scope.
Answer questions about the scope and the participants' skin.

Discussion

- Discuss the role of skin in your health. Use some of the following questions:
  Why is skin health important?
  Why is knowing your skin is an organ like your heart, lungs or liver important?
  What does your skin provide you in terms of health?
  What does your skin provide you in terms of appearance?
  How did it feel to see your skin in the scope?
  How does it feel to know the sun can impact your appearance negatively?
  How might cancer treatment impact your appearance?
  What are specific things you can do to protect your appearance from UV radiation?

Evaluation
During the discussion, gauge the level of understanding of the group. Use the questions specifically asking about impact and protection to assess understanding.

Implementation Intention Add-on

Now complete step 3 on the worksheet. This step states specifically what to do when facing those barriers. Have lifeguards work in groups of 5-6 to brainstorm ideas. Have each group share an example they came up with.

Section III: Appendices

Appendix A: Implementation Intentions Handouts
Appendix B: References

Appendix A: Implementation Intentions Handout

Swimming Pool Lifeguard Actions toward Skin Health (SPLASH)
Implementation Intentions Worksheet

Module 1	Module 2	Module 3
My Goals Are…	It is difficult to reach my goals because…	When it is difficult, I will…
Example: Stay in the shade as much as possible while at work.	Example: I sit on the lifeguard stand for two hours each shift.	Example: I will open the umbrella shade at the beginning of each rotation.

Appendix B: References

American Cancer Society. (2012). *Cancer Facts and Figures 2012.* Retrieved from http://www.cancer.org/research/cancerfactsfigures/cancerfactsfigures/cancer-facts-figures-2012.

American Cancer Society. (2012). *Melanoma skin cancer detailed guide.* Retrieved from http://www.cancer.org/acs/groups/cid/documents/webcontent/003120-pdf.pdf

Gardner, H., & Hatch, T. (1989). Multiple intelligences go to school: Educational implications of the theory of multiple intelligences. *Educational Researcher, 18*(8), 4-9.

Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist, 54*(7), 493-503.

Kaufman, D. (1996). Constructivist-based experiential learning in teacher education. *Action in Teacher Education, 18*(2), 40-49.

Kligman, L. H. (1986). Photoaging. Manifestations, prevention and treatment. *Clinics in Dermatology, 4*(3), 517-528.

National Cancer Institute. (2012). *Genetics of Skin Cancer (PDQ®).* Retrieved from http://www.cancer.gov/cancertopics/pdq/genetics/skin/HealthProfessional/page4.

Prawat, R. S., & Floden, R. E. (1994). Philosophcal perspectives on constructivist views of learning. *Educational Psychologist, 29*(1), 37-48.

Reed, K. B., Brewer, J. D., Lohse, C. M., Bringe, K. E., Pruitt, C. N., & Gibson, L. E. (2012). Increasing incidence of melanoma among young adults: An epidemiological study in Olmstead County, Minnesota. *Mayo Clinic Proceedings, 87*(4), 328-334.

Rippetoe, P. A., & Rogers, R. W. (1987). Effects of components of protection-motivation theory on adaptive and maladaptive coping with a health threat. *Journal of Personality and Social Psychology, 52,* 596-604.

Roblyer, M. (2005). *Integrating educational technology into teaching.* Upper Saddle River, NJ: Prentice Hall.

Skin Cancer Foundation. (2012). *Skin Cancer Facts.* Retrieved from http://www.skincancer.org/skin-cancer-information/basal-cell-carcinoma/bcc-prevention-guidelines.

Skin Cancer Foundation. (2012). *Early Detection and Skin Exams.* Retrieved from http://www.skincancer.org/skin-cancer-information/early-detection

Witte, K. (1992). Putting fear back into fear appeals: The Extended Parallel Process Model. *Communication Monographs, 59,* 329-349.